SAR EVALUATION REPORT

For

SHENZHEN HYT SCIENCE & TECHNOLOGY CO., LTD

R2-High-Tech Industrial Park
ShenZhen, China

FCC ID: R74TC-500

This Report Concerns: ☒ Original Report	**Equipment Type:** Two-way Radio
Test Engineer:	Eric Hong
Report No.:	R0408189S
Report Date:	2004-10-12
Reviewed By:	Daniel Deng
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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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 C95.3-1992 [6] for an uncontrolled environment and 8 mW/g for occupational population (Paragraph 65). According to the Supplement C of OET Bulletin 65 (01-2001) “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 for uncontrolled environment and 8 mW/g for occupational population 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.

The investigation was limited to the worst-case scenario from the device usage point of view. For the clarity of data analysis, and clarity of presentation, only one tissue simulation was used for the head and body simulation. This means that if SAR was found at the headset position, the magnitude of SAR would be overestimated comparing to SAR to a headset placed in the ear region.

There was no SAR of any concern measured on the device for any of the investigated configurations, please see following table for testing result summary:

Ambient=23^{o}C, Liquid Temp=22^{o}C
Relative Humidity (%): 49.3

Worst case SAR reading

EUT position	Frequency (MHz)	Conducted Power (W)	Test Type	Antenna Type	Liquid	Phantom	Notes / Accessories	Measured (mW/g)		Limit (mW/g)	Plot #
								100%	50% duty cycle		
2.5 cm head separation to phantom	460	4.467	Face-held	Built-in	head	flat	none	3.65	1.825	8	1
back touching phantom	460	4.467	Body worn	Built-in	body	flat	Headset and Pouch	3.80	1.900	8	2
	460	4.467					Microphone and Belt Clip	4.36	2.180	8	3
	460	4.467					Microphone and Pouch	4.26	2.130	8	4

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-field 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-_eld 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 Equipment List & Calibration Info

Equipment Type	Model	Manufacturer	Serial No.	Cal. Date
Amplifer, Power	2HL-2-8	Mini-Circuits		N/R
Amplifier, Pre	8449B	Agilent	3008A01978	3/8/2004
Amplifier, RF Power	503L	ENI	285	N/R
Analyzer, Network	8752C	HP	3410A02356	8/11/2002
Analyzer, Spectrum , RF	8566A	HP	2240A01930	N/R
Antenna, Dipole	D-1800-S-2	Aprel	BCL-049	3/6/2003
Antenna, Dipole	D-2450-S-1	Aprel	BCL-141	N/R
Antenna, Dipole	D450V2	N/A	1010	1/24/2003
Antenna, Dipole	D900V2	N/A	122	10/3/2003
Antenna, Dipole	DS100V2	N/A	1001	8/18/2003
Antenna, Logperiodic		HTM	N/A	N/R
Calibrator, Digital	ST-089	Electronic Digital Caliper	211371	N/R
CDMA MS test set	E6393A	Agilent	JP1MJ00416	3/7/2003
Controller		STAUBLI	F01/5J72A1/A/01	N/R
DASY3 Professional Dosimetric System	DASY3	SPEAG	N/A	N/R
Generator, Signal	83650B	HP	3614A00276	1/29/2004
Meter, Power	E4419B	Agilent	MY4121511	4/29/2004
Probe, Dielectric Kit	85070A	Agilent	N/A	self
Probe, Dummy	ET3DV6	SPEAG	1604	N/R
Probe, SPEAG E-Field	ES3DV2	SPEAG	3019	10/9/2003
Robot RX60L	RX60L	SPEAG	F00/5H31A1/A/01	N/R
Scale, Weight	ACS-3D	AI	603101182	N/R
Scale, Weight	MS-7400	Measurement Specialities	N/A	N/R
Sensor, Power	E4412A	Agilent	US384885142	05/07/2004
Sensor, SPEAG Light Alignment	SPEAG Light Alignment Sensor	SPEAG	278	N/R
SPEAG Generic Twin Phantom	SPEAG Generic Twin Phantom	SPEAG	N/A	N/R

2.2 Equipment Calibration

Please see the attached file.

2.2.1 Probe Calibration

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:	Nico Vetterli	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.

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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!)

ES3DV2 SN: 3019 **July 12, 2003**

DASY - Parameters of Probe: ES3DV2 SN: 3019

Sensitivity in Free Space

Diode Compression

NormX	**1.03** $\mu V/(V/m)^2$	DCP X	99
NormY	**1.12** $\mu V/(V/m)^2$	DCP Y	99
NormZ	**0.98** $\mu V/(V/m)^2$	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**

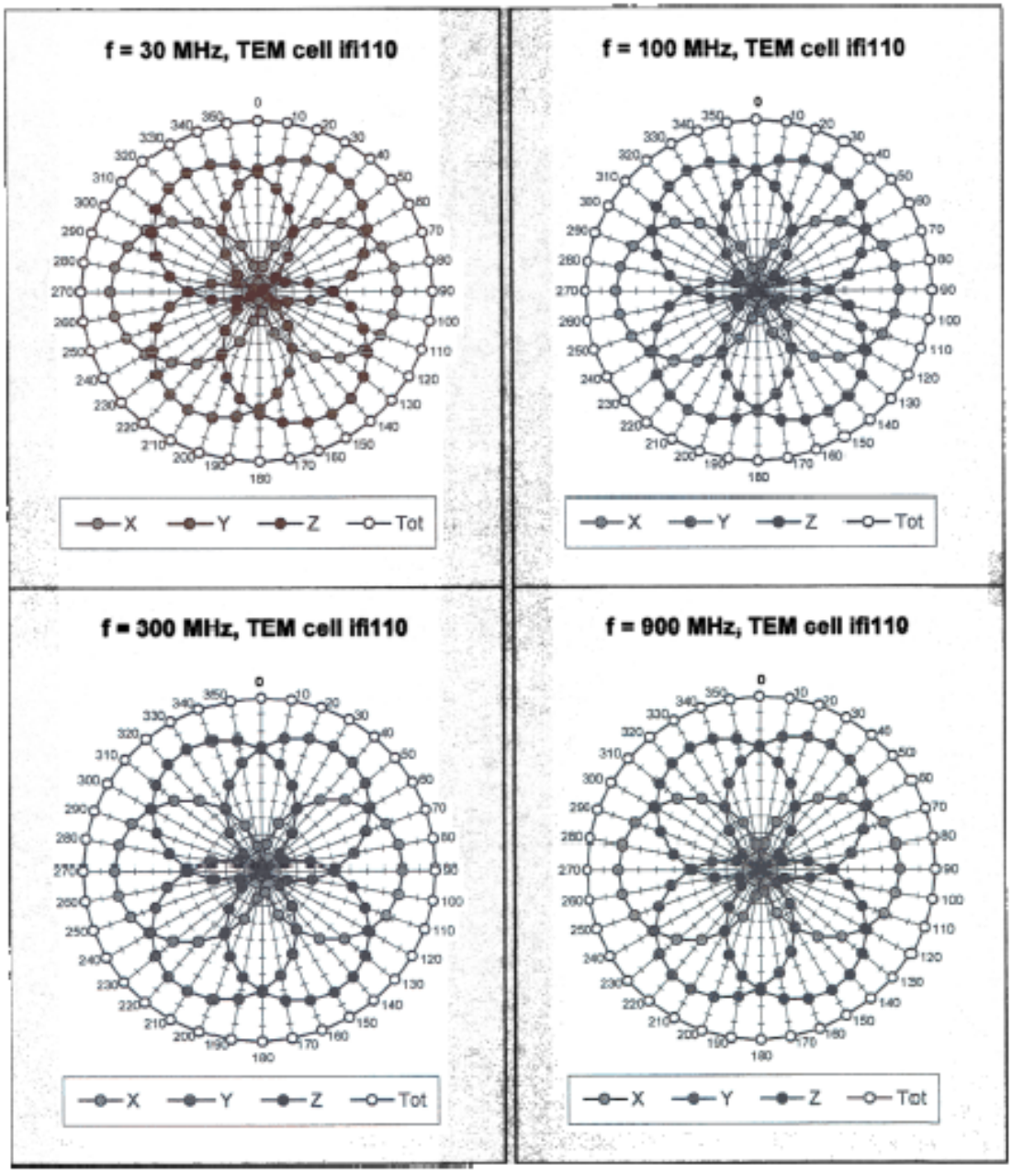
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	7.4	5.0
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

Sensor Offset

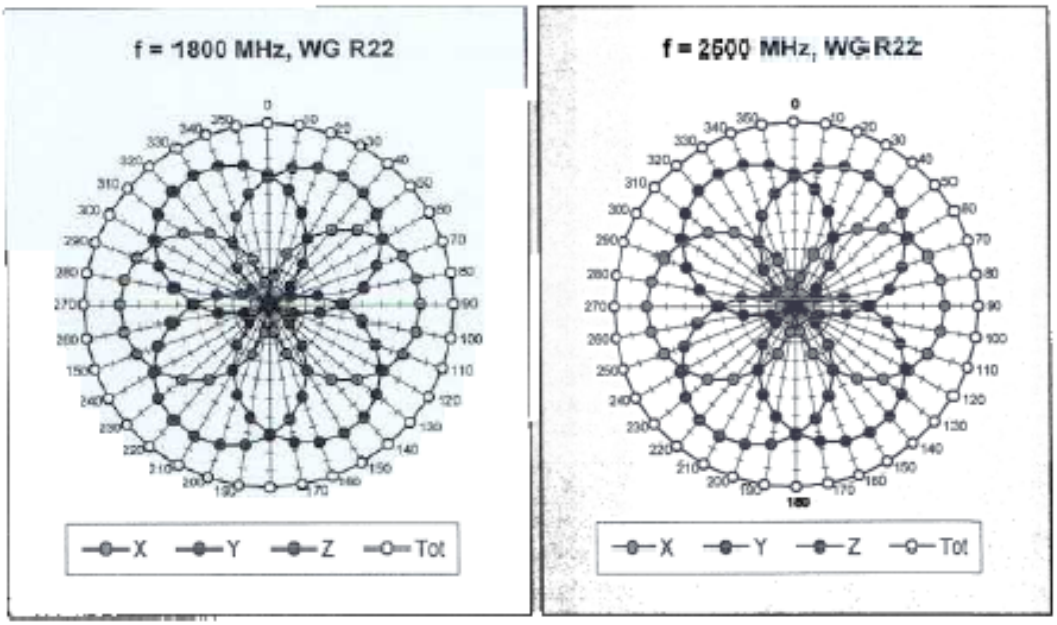
Probe Tip to Sensor Center	**2.1**	mm

ES3DV2 SN: 3019 **July 12, 2003**

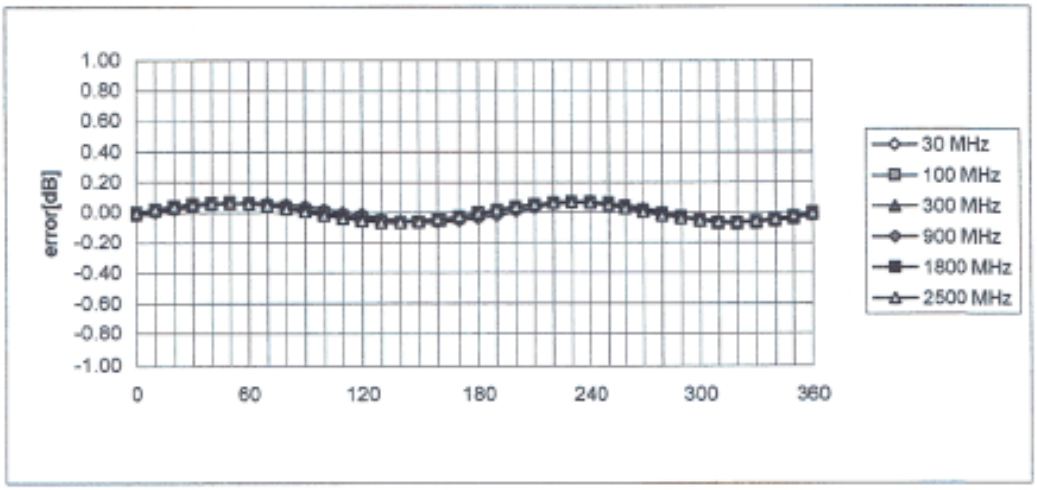
Receiving Pattern (ϕ , θ = 0°



ES3DV2 SN: 3019 July 2003



Isotropy Error (ϕ), θ = 0°



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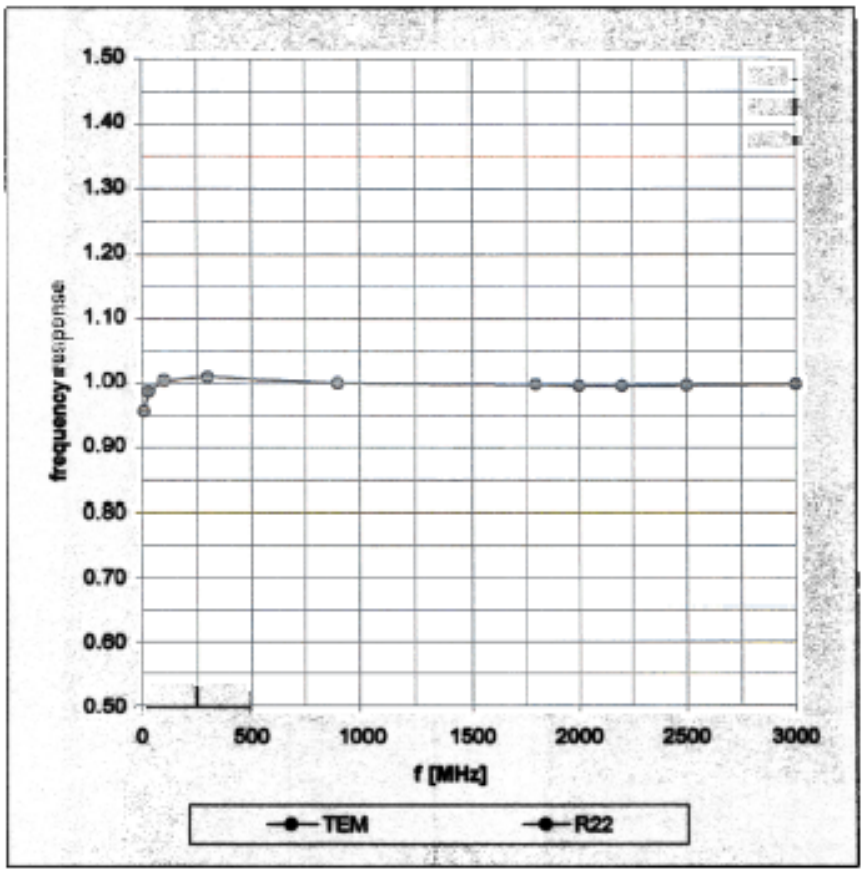
Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)



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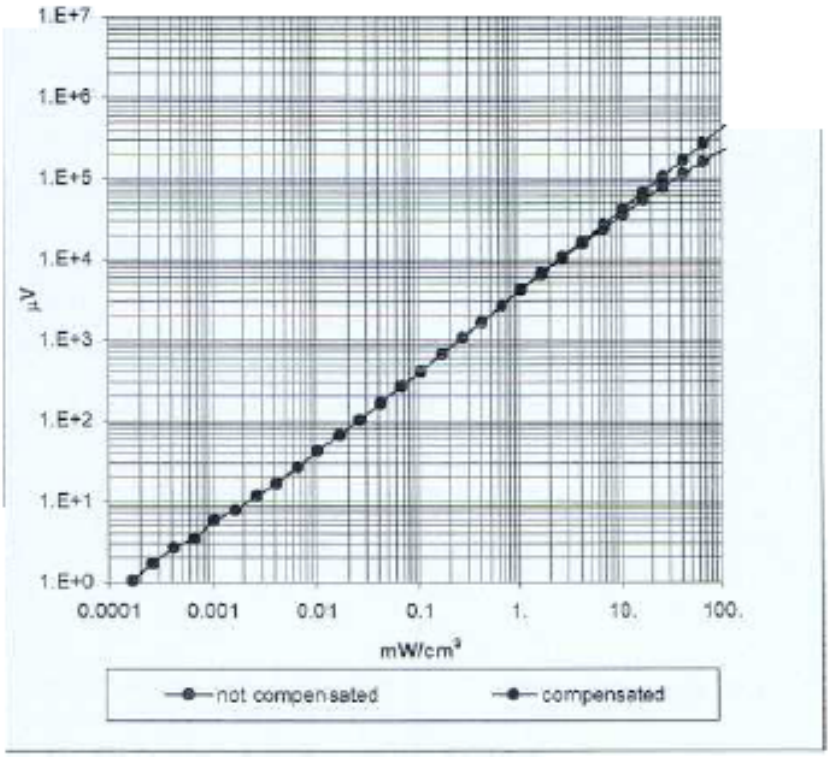
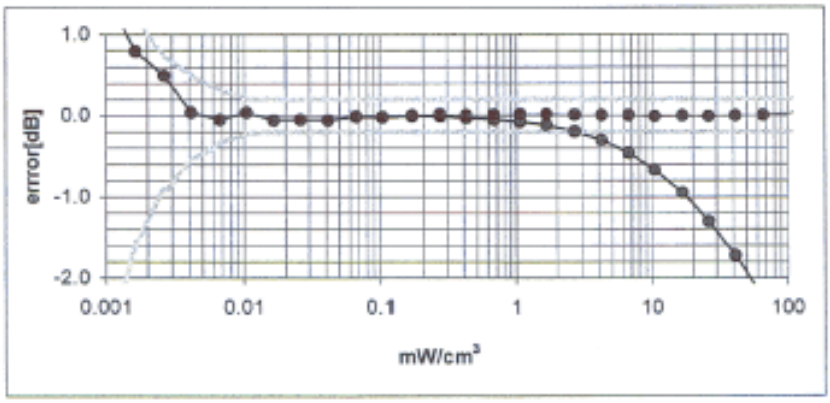
Dynamic Range f(SAR_{brain})

(Waveguide R22)





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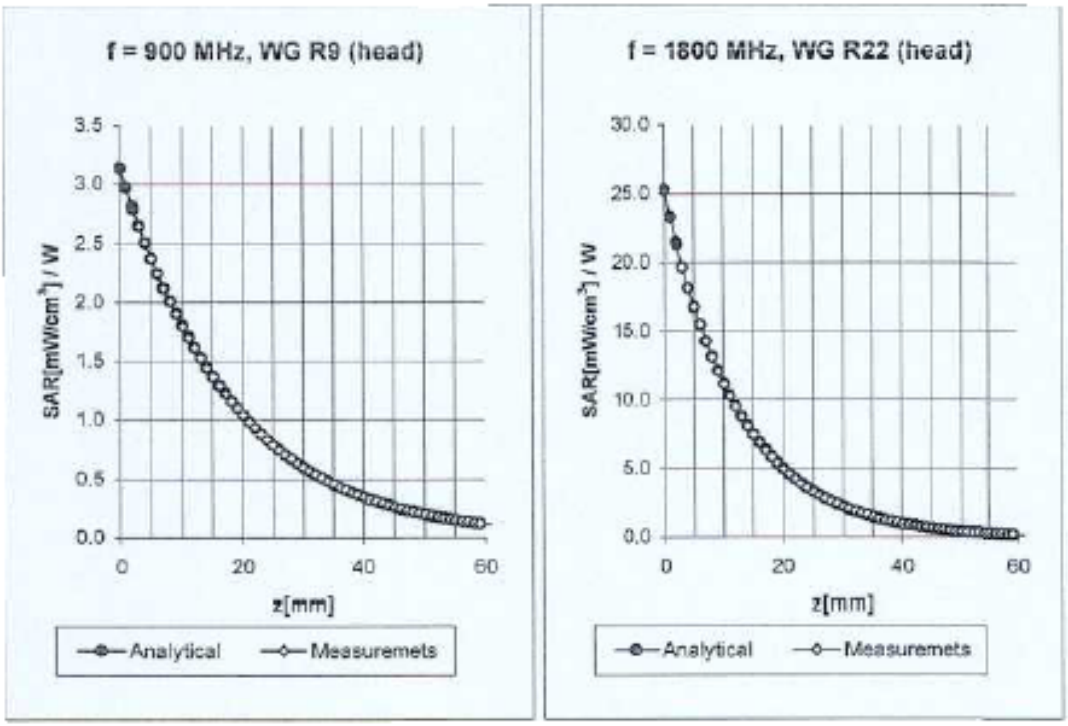
Conversion Factor Assessment



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**

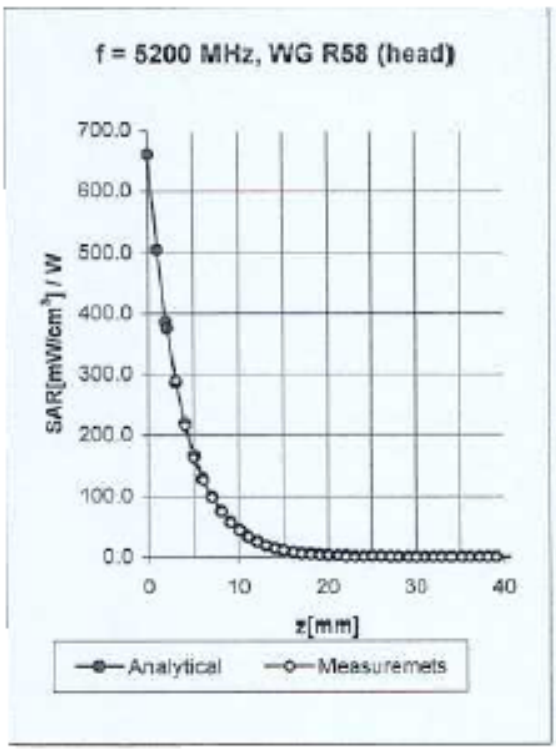
1800 MHz ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

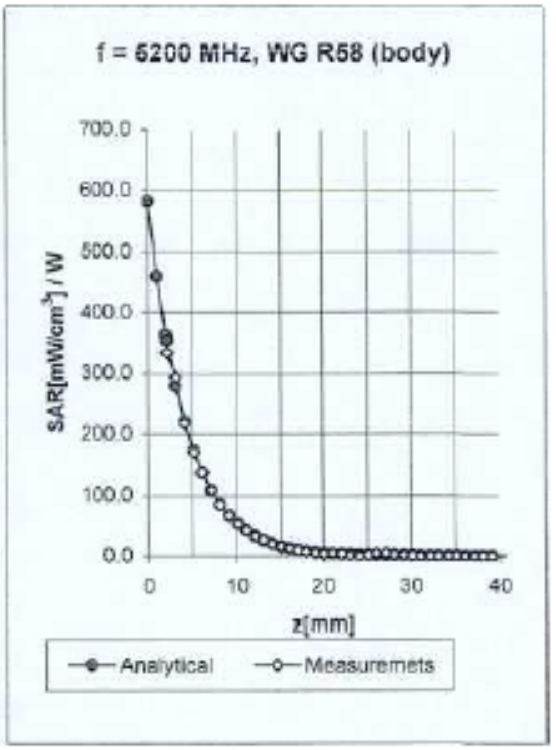
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

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**

ES3DV2 SN: 3019 **July 12, 2003**

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**

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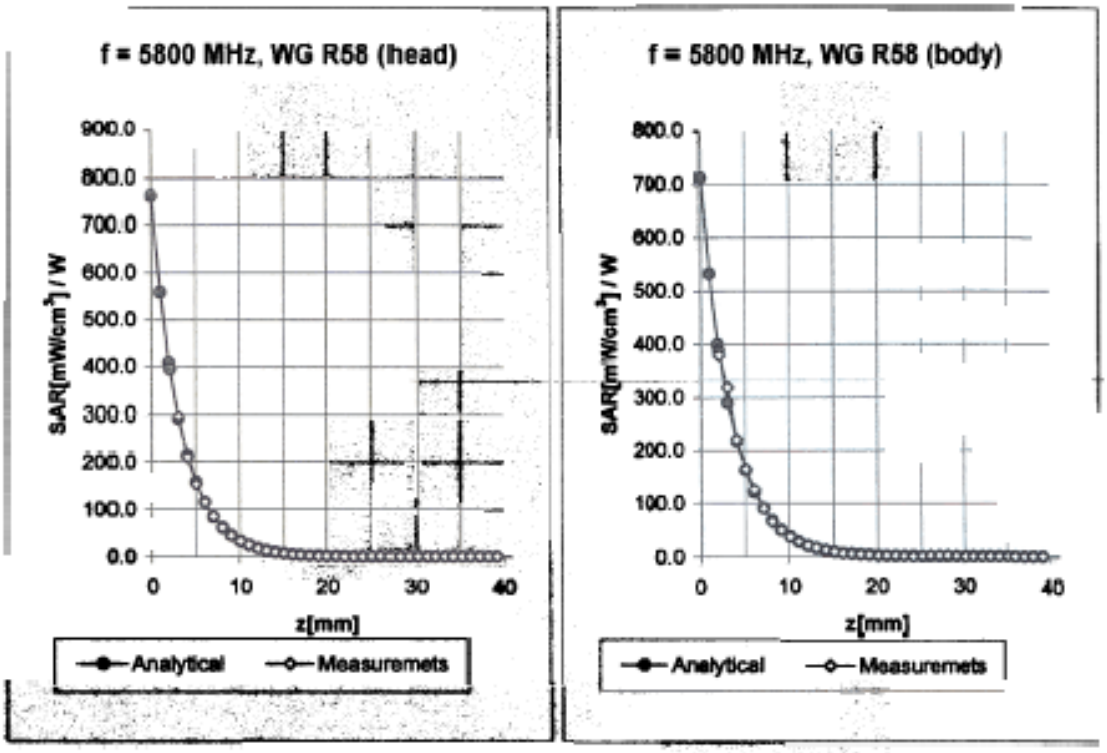
Conversion Factor Assessment



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

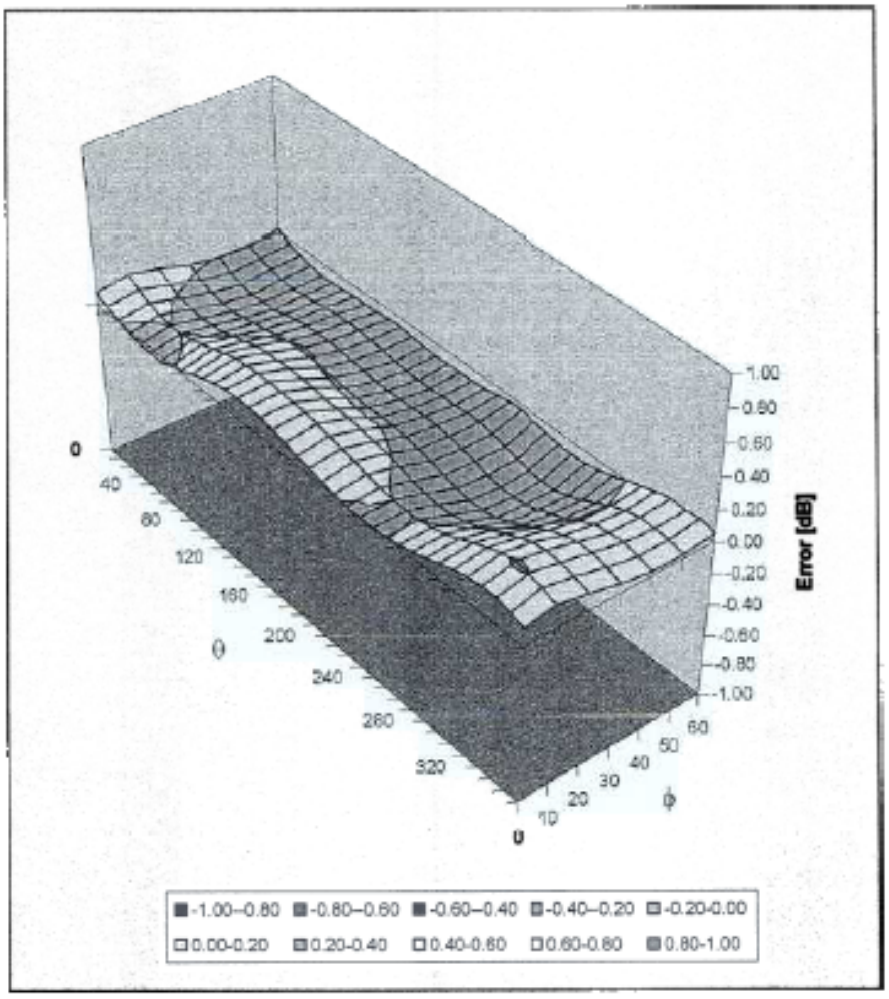
Valid for f=5510-6090 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

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 Zürich, 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!)

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** $\mu V/(V/m)^2$

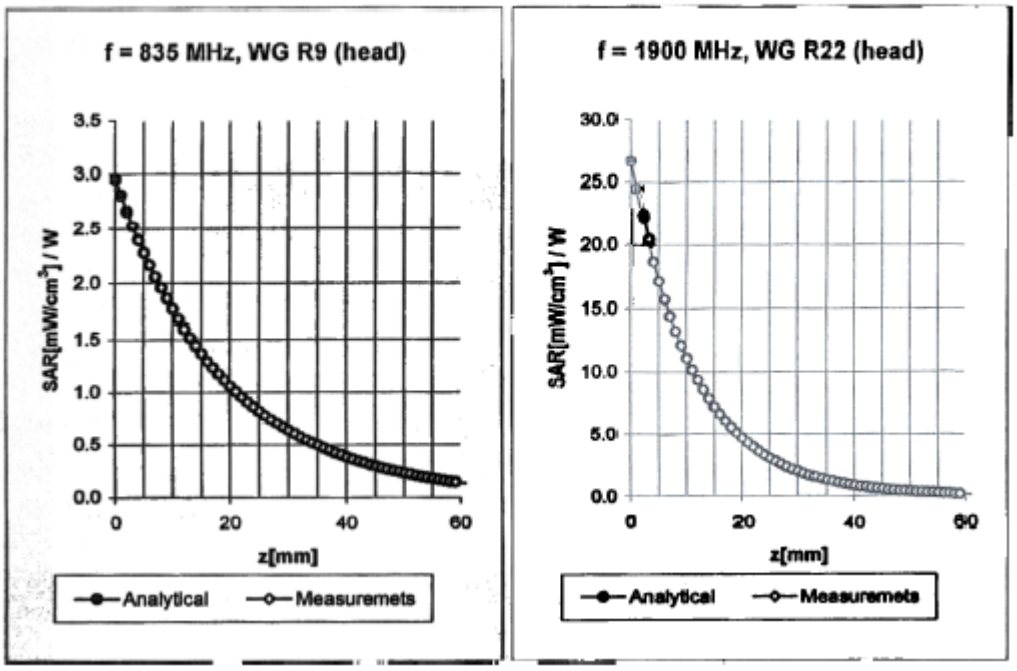
Diode Compression

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

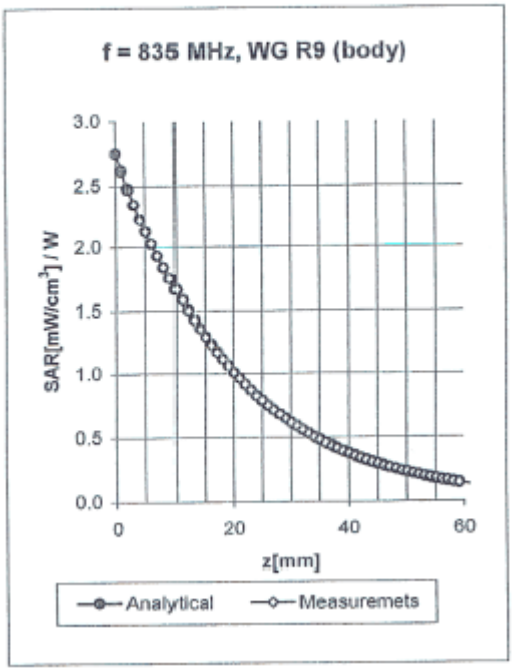
ConvF X	**6.5** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.5** ± 9.5% (k=2)	Alpha	**0.35**
ConvF Z	**6.5** ± 9.5% (k=2)	Depth	**1.46**

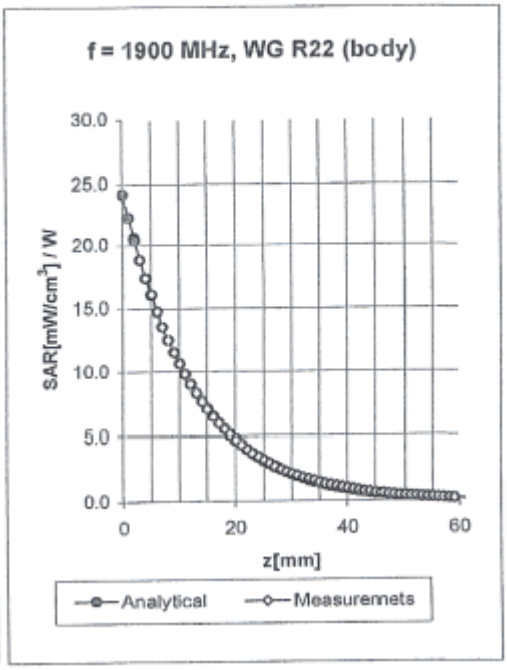
Head **1900 MHz** ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

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**

Conversion 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

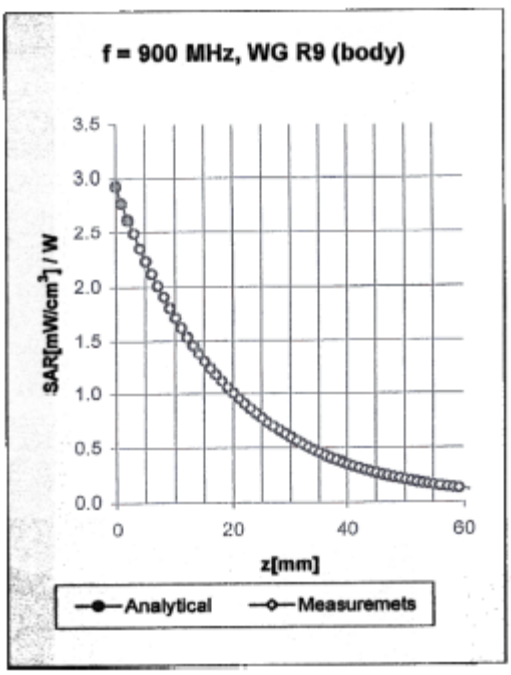
ConvF X	**6.1** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)	Alpha	**0.24**
ConvF Z	**6.1** ± 9.5% (k=2)	Depth	**2.00**

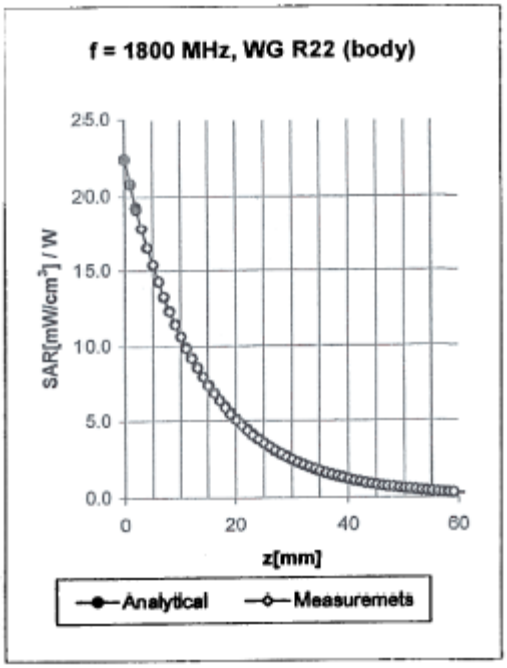
Body **1900 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

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**

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

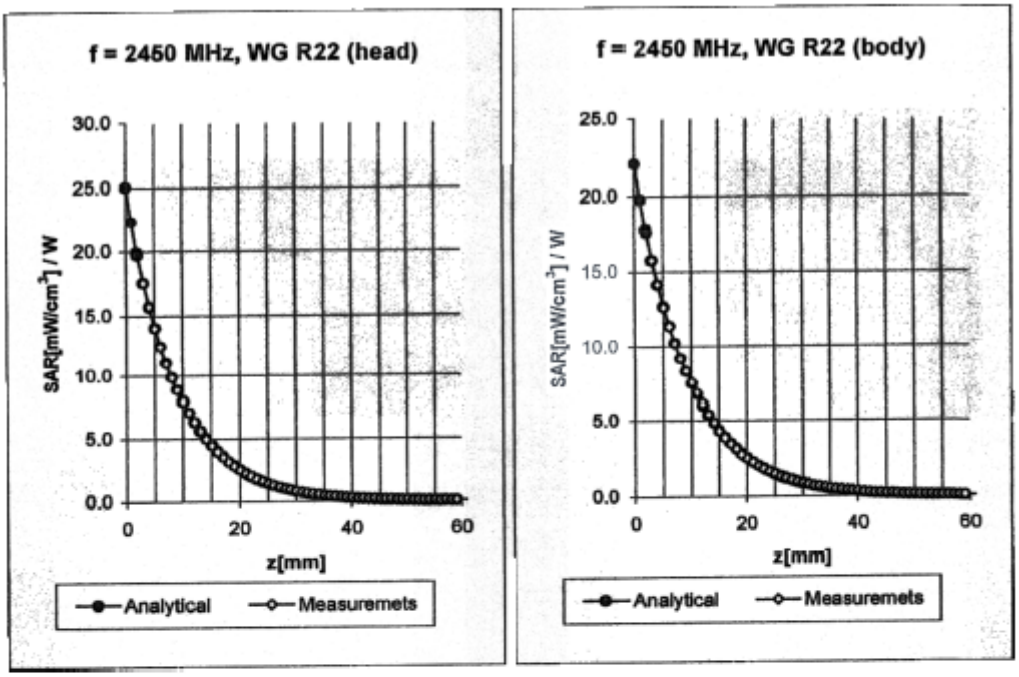
ConvF X	6.1 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.1 ± 9.5% (k=2)	Alpha	0.27
ConvF Z	6.1 ± 9.5% (k=2)	Depth	1.82

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**

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**

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	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

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Dosimetric E-Field Probe ES3DV2 SN:3019

Conversion factor (± standard deviation)

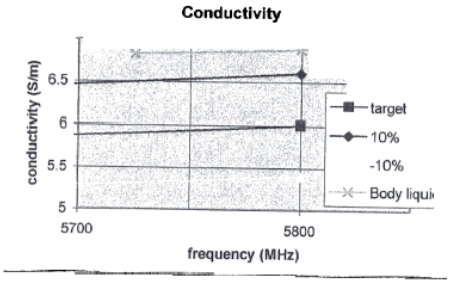
150 MHz	ConvF	**8.7 ± 8%**	$\varepsilon_r = 52.3 \pm 5\%$ $\sigma = 0.76 \pm 5\%$ mho/m (head tissue)
150 MHz	ConvF	**8.3 ± 8%**	$\varepsilon_r = 61.9 \pm 5\%$ $\sigma = 0.80 \pm 5\%$ mho/m (body tissue)
450 MHz	ConvF	**7.4 ± 8%**	$\varepsilon_r = 43.5 \pm 5\%$ $\sigma = 0.87 \pm 5\%$ mho/m (head tissue)
450 MHz	ConvF	**7.3 ± 8%**	$\varepsilon_r = 56.7 \pm 5\%$ $\sigma = 0.94 \pm 5\%$ mho/m (body tissue)

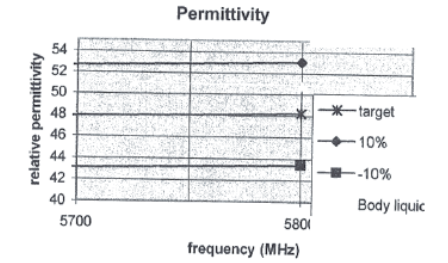
ES3DV2-SN:3019 **October 13, 2003**

Freq. (MHz)	Amplitude (dB)	Phase (deg)	Rel. Perm	Condy (S/m)
5725	-53.5	152	51	6.829
5800	-54	138	50.81	6.891
5825	-54.75	134	50.65	6.996

Freq. (MHz)	Rel. Perm.	Condy (S/m)	
400	45.3	0.87	
835	41.5	0.9	
900	41.5	0.97	
1450	40.5	1.2	
1800	40	1.4	
2000	40	1.4	
2450	39.2	1.8	
3000	38.5	2.4	
5800	48.2	6	
400	49.83	0.96	10
835	45.65	0.99	High %
900	45.65	1.07	
1450	44.55	1.32	
1800	44.00	1.54	
2000	44.00	1.54	
2450	43.12	1.98	
3000	42.35	2.64	
5800	53.02	6.60	
400	40.77	0.78	10
835	37.35	0.81	Low %
900	37.35	0.87	
1450	36.45	1.08	
1800	36.00	1.26	
2000	36.00	1.26	
2450	35.28	1.62	
3000	34.65	2.16	
5800	43.38	5.4	

0

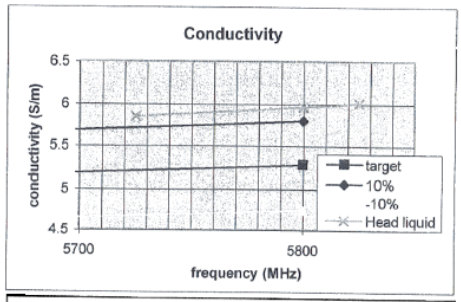


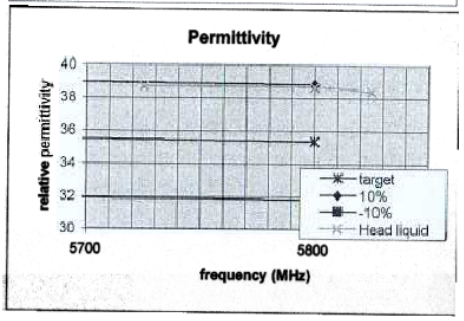


Freq. (MHz)	Amplitude (dB)	Phase (deg)	Rel. Perm.	Condy (S/m)
5725	-51.65	-20.5	38.7	5.849
5800	-52.5	-35	38.68	5.959
5825	-53	-35.6	38.39	6.008

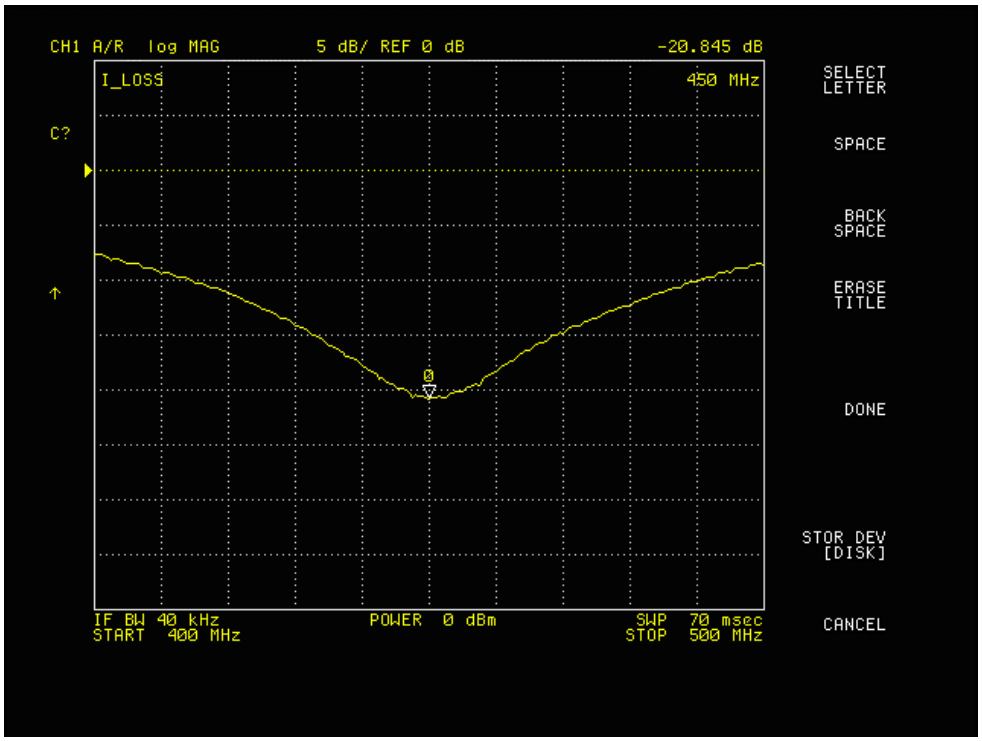
Freq. (MHz)	Rel. Perm.	Condy (S/m)	
400	45.3	0.87	
835	41.5	0.9	
900	41.5	0.97	
1450	40.5	1.2	
1800	40	1.4	
2000	40	1.4	
2450	39.2	1.8	
3000	38.5	2.4	
5800	35.33	5.27	
400	49.83	0.96	10
835	45.65	0.99	High %
900	45.65	1.07	
1450	44.55	1.32	
1800	44.00	1.54	
2000	44.00	1.54	
2450	43.12	1.98	
3000	42.35	2.64	
5800	38.86	5.80	
400	40.77	0.78	10
835	37.35	0.81	Low %
900	37.35	0.87	
1450	36.45	1.08	
1800	36.00	1.26	
2000	36.00	1.26	
2450	35.28	1.62	
3000	34.65	2.16	
5800	31.797	4.743	

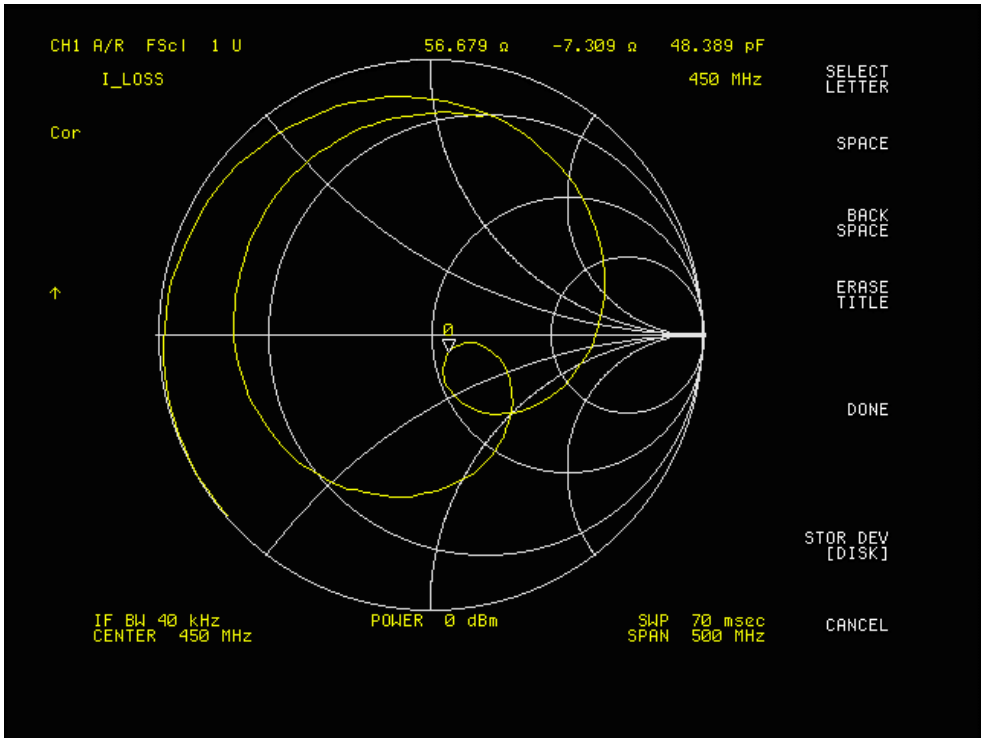
5 0





2.2.2 Dipole Calibration





450 MHz Body Liquid Validation, Ambient Temp=23 Deg C , Liquid Temp=22 Deg C , 9/27/2004

Frequency	e'	e"
400000000.0000	57.0121	38.8121
402000000.0000	56.9013	38.7989
404000000.0000	56.8471	38.7640
406000000.0000	56.8987	38.6184
408000000.0000	56.8025	38.5813
410000000.0000	56.7941	38.4625
412000000.0000	56.7530	38.3046
414000000.0000	56.7420	38.2931
416000000.0000	56.6957	38.1232
418000000.0000	56.5019	38.2181
420000000.0000	56.4673	38.1874
422000000.0000	56.3902	38.1149
424000000.0000	56.2556	38.0197
426000000.0000	56.1079	37.9642
428000000.0000	56.1504	37.8131
430000000.0000	56.0339	37.7648
432000000.0000	56.0942	37.6029
434000000.0000	56.1317	37.5210
436000000.0000	56.2973	37.4718
438000000.0000	56.3191	37.5498
440000000.0000	56.5973	37.6624
442000000.0000	56.9618	37.7540
444000000.0000	56.8290	37.8072
446000000.0000	56.7924	37.8263
448000000.0000	56.8045	37.9795
450000000.0000	56.6309	37.9495
452000000.0000	56.6617	37.8354
454000000.0000	56.5839	37.7590
456000000.0000	56.5083	37.6104
458000000.0000	56.4315	37.6258
460000000.0000	56.3642	37.5521
462000000.0000	56.2017	37.4963
464000000.0000	56.1321	37.3457
466000000.0000	56.0119	37.2801
468000000.0000	55.9213	37.1545
470000000.0000	55.8832	37.0297
472000000.0000	55.7674	36.9789
474000000.0000	55.6288	36.8421
476000000.0000	55.5451	36.8074
478000000.0000	55.3558	36.7112
480000000.0000	55.4985	36.6241
482000000.0000	55.3821	36.5874
484000000.0000	55.4636	36.4898
486000000.0000	55.4287	36.3547
488000000.0000	55.3016	36.2570
490000000.0000	55.2321	36.1694
492000000.0000	55.1850	36.1532
494000000.0000	55.0287	36.0874
496000000.0000	54.9819	36.1450
498000000.0000	54.9573	36.0823
500000000.0000	54.8457	36.0102

$\sigma = \omega \varepsilon_o \varepsilon" = 2 \pi f \varepsilon_o \varepsilon" = 0.95$
where $f = 450$
$\varepsilon_o = 8.854 \times 10^{-12}$
$\varepsilon" = 37.9495$

450MHz Head Liquid validation, Ambient Temp=23 Deg C , Liquid Temp=22 Deg C , 6/29/2004

Frequency	e'	e"
400000000.0000	46.9687	36.0209
402000000.0000	46.7365	36.0258
404000000.0000	46.6147	35.8365
406000000.0000	46.5369	35.8012
408000000.0000	46.4284	35.8986
410000000.0000	46.3147	35.8452
412000000.0000	46.2796	35.7254
414000000.0000	46.1410	35.6782
416000000.0000	45.9837	35.5145
418000000.0000	45.7025	35.5987
420000000.0000	45.4364	35.4709
422000000.0000	45.3169	35.4556
424000000.0000	45.2078	35.4189
426000000.0000	44.3124	35.4017
428000000.0000	44.4913	35.3716
430000000.0000	44.3758	35.3521
432000000.0000	44.2865	35.2127
434000000.0000	44.1522	35.1049
436000000.0000	44.0184	35.0454
438000000.0000	43.9937	35.0897
440000000.0000	43.8012	35.0451
442000000.0000	43.7884	35.0014
444000000.0000	43.6697	34.8681
446000000.0000	43.5128	34.7124
448000000.0000	43.3241	34.8389
450000000.0000	43.3236	34.8623
452000000.0000	43.2010	34.7912
454000000.0000	43.1598	34.7026
456000000.0000	42.9916	34.7898
458000000.0000	42.8902	34.6847
460000000.0000	42.7241	34.7692
462000000.0000	42.6986	34.6483
464000000.0000	42.5468	34.5628
466000000.0000	42.5134	34.4537
468000000.0000	42.4257	34.3101
470000000.0000	42.4169	34.2164
472000000.0000	42.3596	34.1642
474000000.0000	42.3347	34.0135
476000000.0000	42.1302	33.8976
478000000.0000	42.0212	33.8785
480000000.0000	41.9768	33.7983
482000000.0000	41.9203	33.6701
484000000.0000	41.8486	33.6178
486000000.0000	41.7989	33.5491
488000000.0000	41.6304	33.4680
490000000.0000	41.5218	33.4136
492000000.0000	41.5101	33.3167
494000000.0000	41.4478	33.2309
496000000.0000	41.3950	33.1672
498000000.0000	41.3543	33.1154
500000000.0000	41.2897	33.1029

$\sigma = \omega \varepsilon_o \varepsilon'' = 2 \pi f \varepsilon_o \varepsilon''=0.8727$
where $f = 450$
$\varepsilon_o = 8.854 \times 10^{-12}$
$\varepsilon'' = 34.8623$

3 - EUT DESCRIPTION

Serial Number:	04731C0163
Applicant:	SHENZHEN HYT SCIENCE&TECHNOLOGY CO.,LTD
Product Description:	Transceiver, PTT Portable, 2-Way Radio
FCC ID:	R74TC-500
Transmitter Frequency:	450 - 470 MHz
Maximum Output Power:	36.33dBm (4.295W)
Dimension:	58mmL x 50mmW x 255mmH
RF Exposure environment:	Occupational Population
Applicable Standard	FCC CFR 47, Part 90
Application Type:	Certification

[1] Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).
[2] IEEE/ANSI Std. C95.3-2002 limits are used to determine compliance with FCC ET Docket 93-62.
Note: The test data was good for test sample only. It may have deviation for other test samples.

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. The EUT was tested by pushing the PTT bottom during the testing.

4.3 Equipment Modifications

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