APPENDIX C

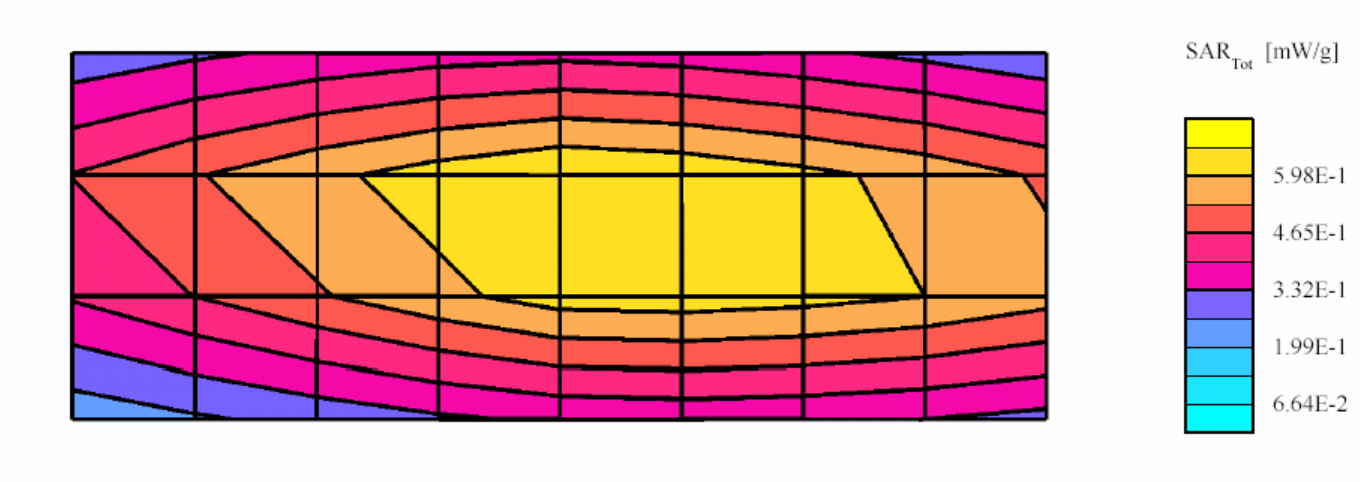
Dipole System Performance Check Results

Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The CGISS EME lab validated the dipole to the applicable IEEE system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the CGISS EME system performance validation are provided in this appendix.

SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/15/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040515-01
TX Freq: 300 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.85 mW/g (1g avg). Percent from target (including drift) is + 4.65 %
SAR calculated at 1W is 1.92 mW/g (10g avg). Percent from target (including drift) is + 4.72 %

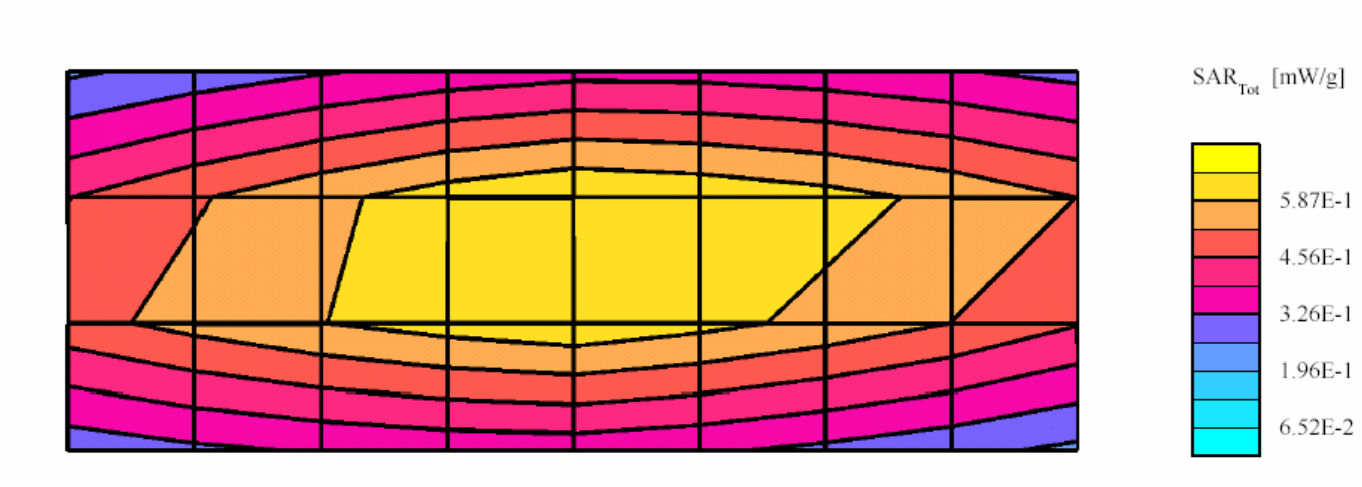
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.89 mho/m ε = 56.7 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.09 mW/g ± 0.01 dB, SAR (1g): 0.710 mW/g ± 0.00 dB, SAR (10g): 0.478 mW/g ± 0.00 dB, (Worst-case extrapolation) Penetration depth: 13.1 (11.6, 15.1) [mm]
Power drift: -0.01 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/16/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040516-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.6 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.84 mW/g (1g avg). Percent from target (including drift) is + 4.41 %
SAR calculated at 1W is 1.91 mW/g (10g avg). Percent from target (including drift) is + 4.26 %

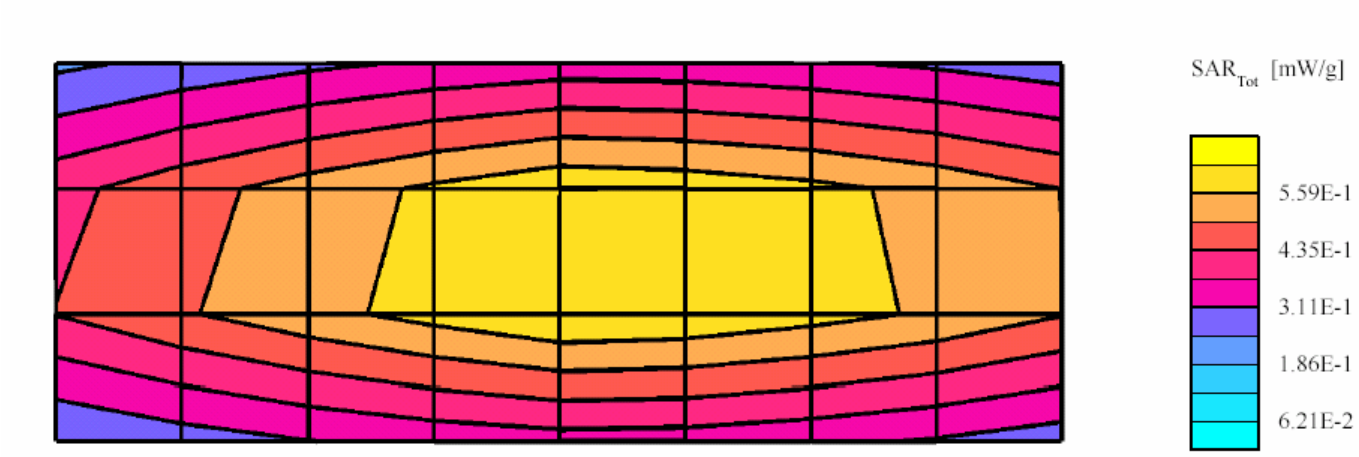
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.89 mho/m ε = 56.2 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.09 mW/g ± 0.01 dB, SAR (1g): 0.710 mW/g ± 0.02 dB, SAR (10g): 0.477 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 13.1 (11.6, 15.2) [mm]
Power drift: 0.00 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/17/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040517-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.6 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.71 mW/g (1g avg). Percent from target (including drift) is - 0.29 %
SAR calculated at 1W is 1.82 mW/g (10g avg). Percent from target (including drift) is - 0.33 %

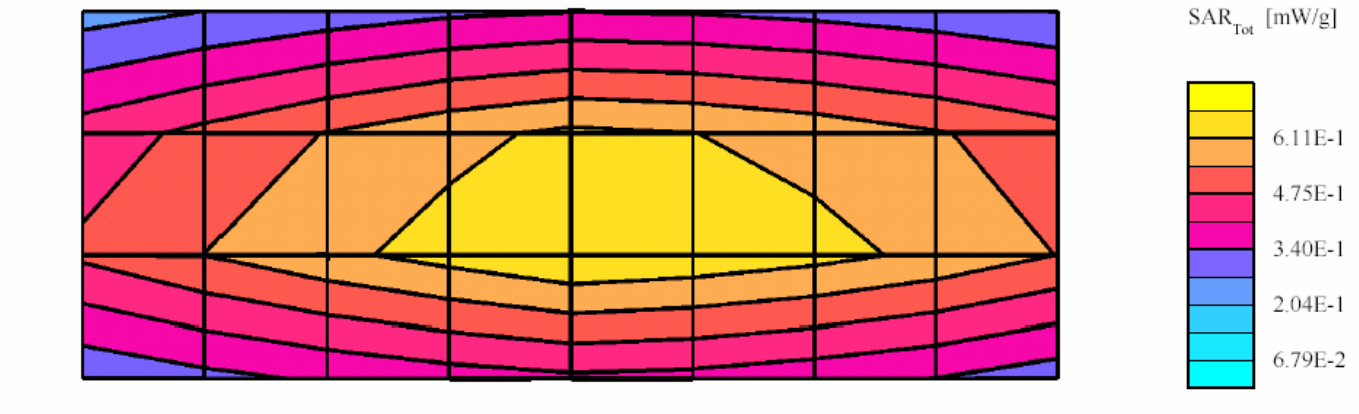
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.89 mho/m ε = 56.9 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.04 mW/g ± 0.02 dB, SAR (1g): 0.678 mW/g ± 0.02 dB, SAR (10g): 0.456 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 13.2 (11.7, 15.2) [mm]
Power drift: 0.00 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/18/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040518-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.7 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.88 mW/g (1g avg). Percent from target (including drift) is +5.83 %
SAR calculated at 1W is 1.94 mW/g (10g avg). Percent from target (including drift) is +5.82 %

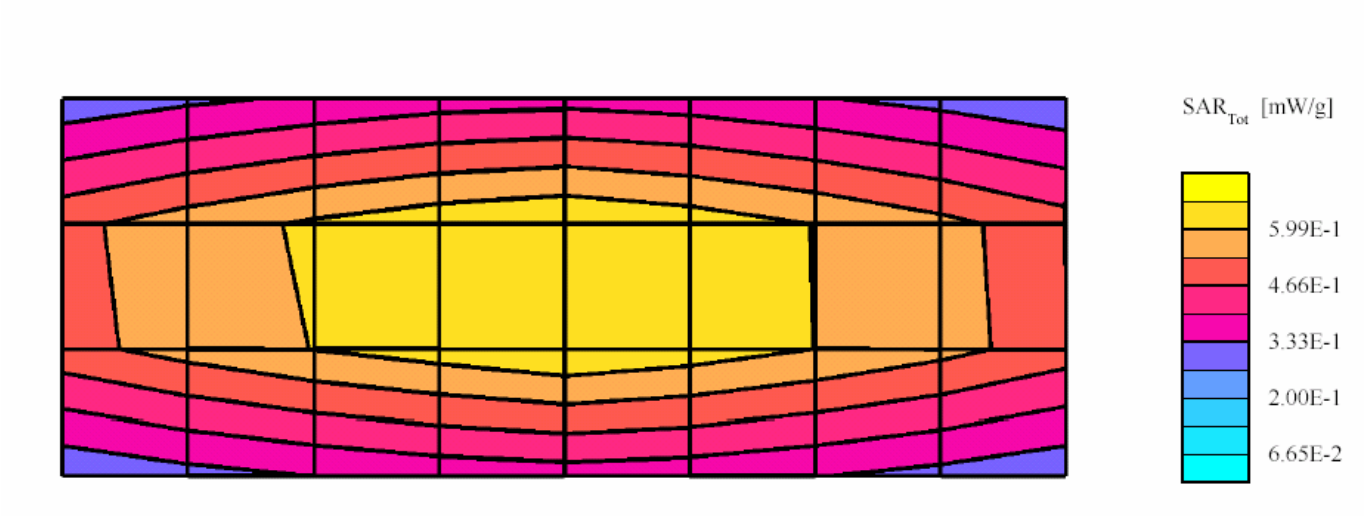
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.89 mho/m ρ = 57.0 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.10 mW/g ± 0.01 dB, SAR (1g): 0.718 mW/g ± 0.02 dB, SAR (10g): 0.483 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 13.2 (11.6, 15.2) [mm]
Power drift: -0.01 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/19/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040519-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.0 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.90 mW/g (1g avg). Percent from target (including drift) is + 6.67 %
SAR calculated at 1W is 1.95 mW/g (10g avg). Percent from target (including drift) is + 6.64 %

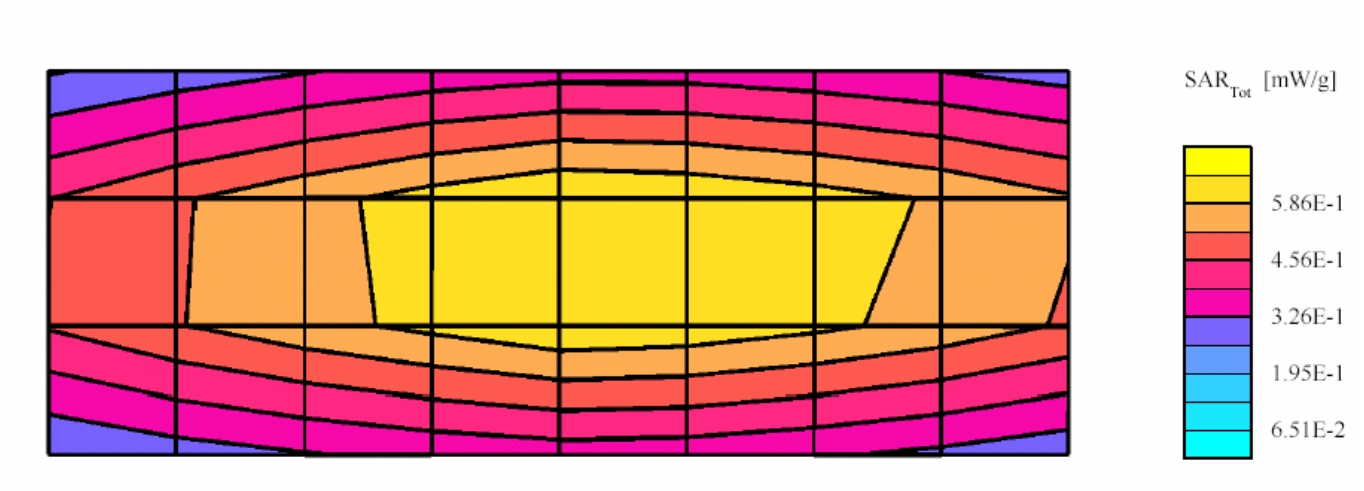
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.90 mho/m ε = 57.1 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.11 mW/g ± 0.01 dB, SAR (1g): 0.727 mW/g ± 0.01 dB, SAR (10g): 0.489 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 13.2 (11.6, 15.2) [mm]
Power drift: 0.01 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/20/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040520-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.0 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.72 mW/g (1g avg, including drift)
SAR target at 1W is 1.83 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.85 mW/g (1g avg). Percent from target (including drift) is + 4.80 %
SAR calculated at 1W is 1.92 mW/g (10g avg). Percent from target (including drift) is + 4.94 %

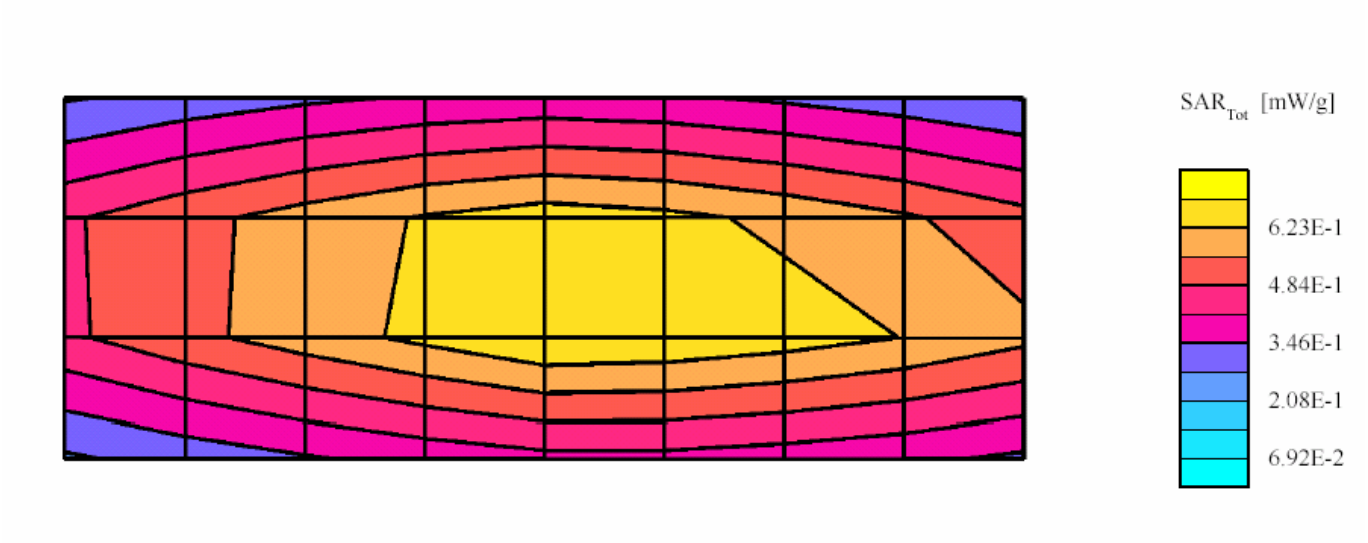
Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300 MHz: σ = 0.90 mho/m ε = 56.9 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.09 mW/g ± 0.01 dB, SAR (1g): 0.711 mW/g ± 0.02 dB, SAR (10g): 0.479 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 13.2 (11.6, 15.2) [mm]
Power drift: -0.01 dB



SPEAG 300 MHz Dipole; Model D300V2, SN 1001; Test Date: 5/21/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040521-04
TX Freq: 300 MHz
Sim Tissue Temp: 20.8 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.81 mW/g (1g avg, including drift)
SAR target at 1W is 1.88 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.97 mW/g (1g avg). Percent from target (including drift) is + 5.62 %
SAR calculated at 1W is 1.99 mW/g (10g avg). Percent from target (including drift) is + 5.74 %

Flat Phantom; Device Probe: ET3DV6 - SN1547(Cal Date 09-23-2003);Probe Cal Date: 19/09/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; IEEE Head 300MHz: σ = 0.87mho/m ε = 46.3 ρ = 1.00 g/cm3; DAE3: SN374 DAE Cal Date: 03/23/2004
Cubes (2): Peak: 1.14 mW/g ± 0.04 dB, SAR (1g): 0.742 mW/g ± 0.01 dB, SAR (10g): 0.497 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.9 (11.4, 14.8) [mm]
Power drift: -0.00 dB



SYSTEM VALIDATION

Date:	12/16/2003	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	300-IEEE Head
Robot System:	CGISS-1	Ambient Temp.(°C):	22.8
Probe Serial #:	1384	Tissue Temp.(°C):	20.9
DAE Serial #:	DAE3V1 SN363		

Tissue Characteristics

Permitivity:	47.2	Phantom Type/SN:	80602002B/S2
Conductivity:	0.84	Distance (mm):	15 (tissue/dipole cnt)

Reference Source: Dipole (Dipole)
Reference SN: 1001

Power to Dipole: 250 mW
Power Output (radio): mW

Target SAR Value: 3.00 mW/g, 2.00 mW/g (10g avg.)
(normalized to 1.0 W)

Measured SAR Value: 0.700 mW/g, 0.469 mW/g (10g avg.)
Power Drift: -0.01 dB

Measured SAR Value: 2.81 mW/g, 1.88 mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty): 6.45 % (1g ave)
5.98 % (10g ave)

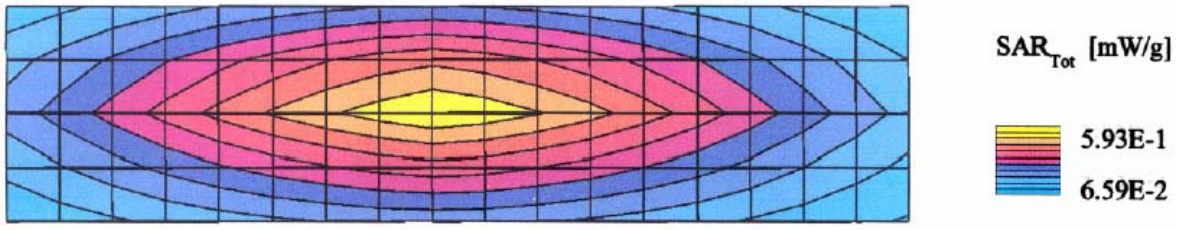
Test performed by: C. Miller Initial: CW

Motorola Internal Use Only Sys. Valid. Form: 021024

SPEAG Dipole 300MHz. Test Date:12/16/03

Run #:Val-D300V2 sn1001-R1-031216-01 Phantom #: 80602002B/S2
Model #: D300V2 SN: 1001
Robot: CGISS-1 Tester: C. Miller
TX Freq: 300 MHz Sim Tissue Temp: 20.9 (Celsius)
Start Power; 250mW
DAE3: 363V1 DAE Cal Date: 05/13/2003
- Comments-
IEEE Table 7-1 Target at 1W is 3.0 (1g)

SAR calculated for 1g is 2.81 mW/g, Percent from target (including drift) for 1g is -6.45 %
SAR calculated for 10g is 1.88 mW/g, Percent from target (including drift) for 10g is -5.98 %
Flat Phantom; Device
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(7.80,7.80,7.80); Crest factor: 1.0; IEEE Head 300MHz: $\sigma = 0.84$ mho/m $\varepsilon_r = 47.2$ $\rho = 1.00$ g/cm^3
Cubes (2): Peak: 1.08 mW/g ± 0.02 dB, SAR (1g): 0.700 mW/g ± 0.02 dB, SAR (10g): 0.469 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 13.2 (11.5, 15.3) [mm]
Powerdrift: -0.01 dB



Motorola CGISS EME Lab

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	12/16/2003	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	300 Body
Robot System:	CGISS-1	Ambient Temp.(°C):	22.8
Probe Serial #:	1384	Tissue Temp.(°C):	20.7
DAE Serial #:	DAE3V2 SN363		

Tissue Characteristics

Permitivity:	56.8	Phantom Type/SN:	80602002A/S1
Conductivity:	0.89	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	Dipole (Dipole)
Reference SN:	1001

Power to Dipole: 250 mW

Measured SAR Value:	0.678 mW/g,	0.457 mW/g (10g avg.)
Power Drift:	-0.01 dB	

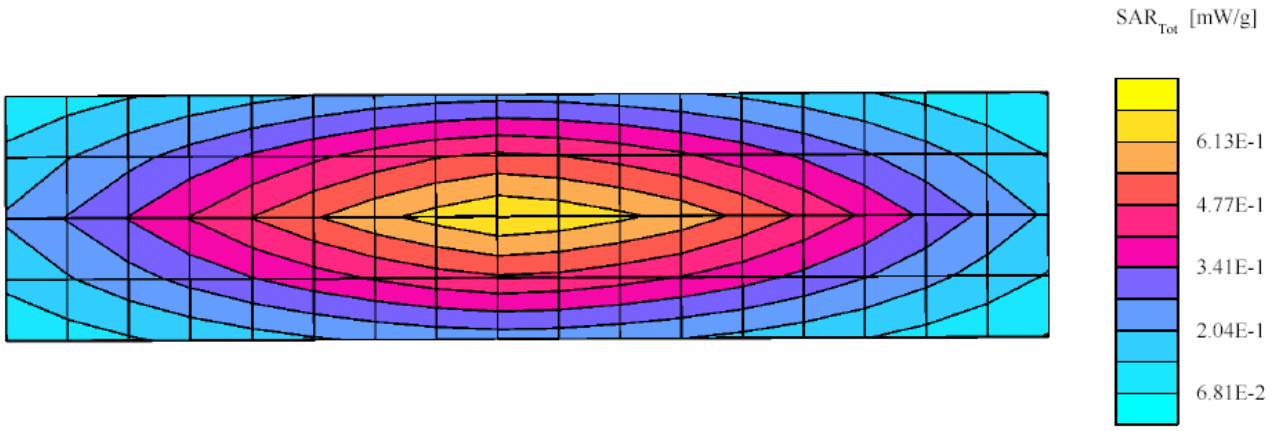
New Target/Measured SAR Value: (normalized to 1.0 W, including drift)	2.72 mW/g,	1.83 mW/g (10g avg.)

Test performed by: C. Miller Initial:

SPEAG Dipole 300MHz. Test Date:12/16/03

Run #:Val-D300V2 sn1001-R1-031216-02 Phantom #: 80602002A/S1
Model #: D300V2 SN: 1001
Robot: CGISS-1 Tester: C. Miller
TX Freq: 300 MHz Sim Tissue Temp: 20.7 (Celsius)
Start Power; 250mW
DAE3: 363V1 DAE Cal Date: 05/13/2003
- Comments-

SAR calculated for 1g is 2.72 mW/g, Percent from target (including drift) for 1g is -0.06 %
SAR calculated for 10g is 1.83 mW/g, Percent from target (including drift) for 10g is 0.12 %
Flat Phantom; Device
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(7.90,7.90,7.90); Crest factor: 1.0; FCC Body 300 MHz: $\sigma = 0.89$ mho/m $\varepsilon_r = 56.8$ $\rho = 1.00$ g/cm³
Cubes (2): Peak: 1.04 mW/g ± 0.00 dB, SAR (1g): 0.678 mW/g ± 0.02 dB, SAR (10g): 0.457 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 13.3 (11.6, 15.4) [mm]
Powerdrift: -0.01 dB



APPENDIX D

Probe/Dipole Calibration Certificates

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

Client Motorola CGISS

CALIBRATION CERTIFICATE

Object(s) ET3DV6 - SN:1547

Calibration procedure(s) QA CAL-01.v2
Calibration procedure for dosimetric E-field probes

Calibration date: September 19, 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:	Katja Pokovic	Laboratory Director	
Approved by:	Fin Bomholt	R&D Director	

Date issued: September 20, 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.

DASY - Parameters of Probe: ET3DV6 SN:1547

Sensitivity in Free Space

Diode Compression

NormX	1.39 $\mu V/(V/m)^2$	DCP X	90	mV
NormY	1.24 $\mu V/(V/m)^2$	DCP Y	90	mV
NormZ	1.24 $\mu V/(V/m)^2$	DCP Z	90	mV

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	6.3 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.3 ± 9.5% (k=2)	Alpha	0.45
ConvF Z	6.3 ± 9.5% (k=2)	Depth	2.41

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	5.2 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.2 ± 9.5% (k=2)	Alpha	0.50
ConvF Z	5.2 ± 9.5% (k=2)	Depth	2.61

Boundary Effect

Head 900 MHz **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	10.9	6.3
SAR_{be} [%]	With Correction Algorithm	0.3	0.5

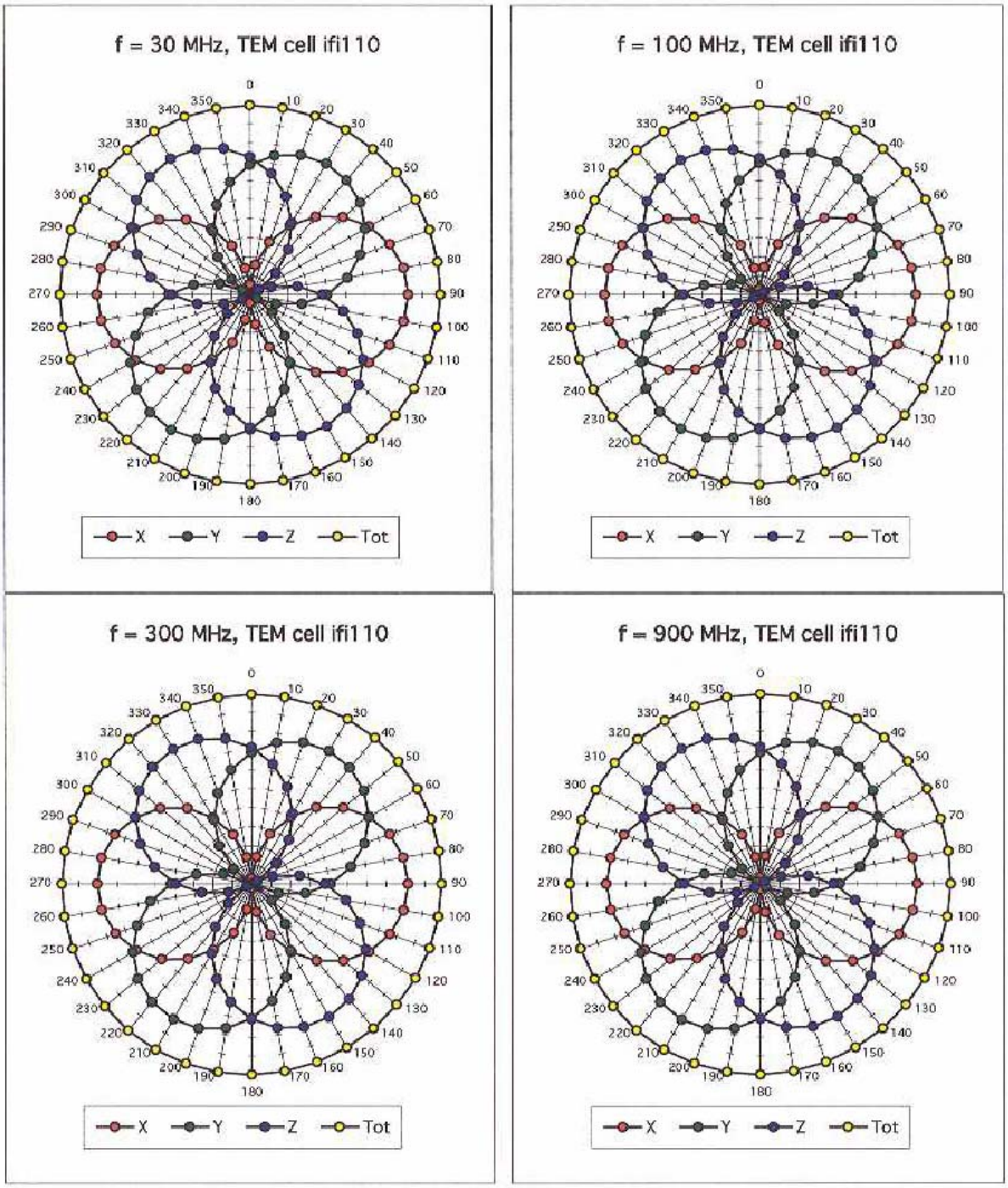
Head 1800 MHz **Typical SAR gradient: 10 % per mm**

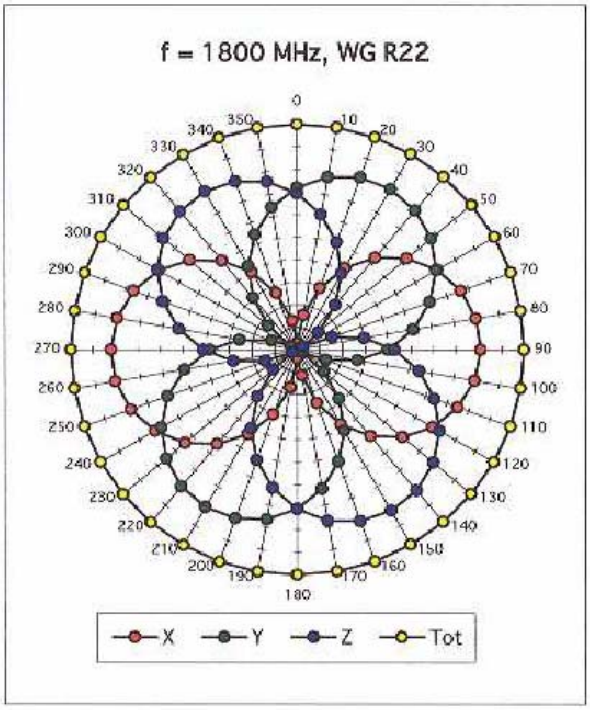
Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	13.6	9.2
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

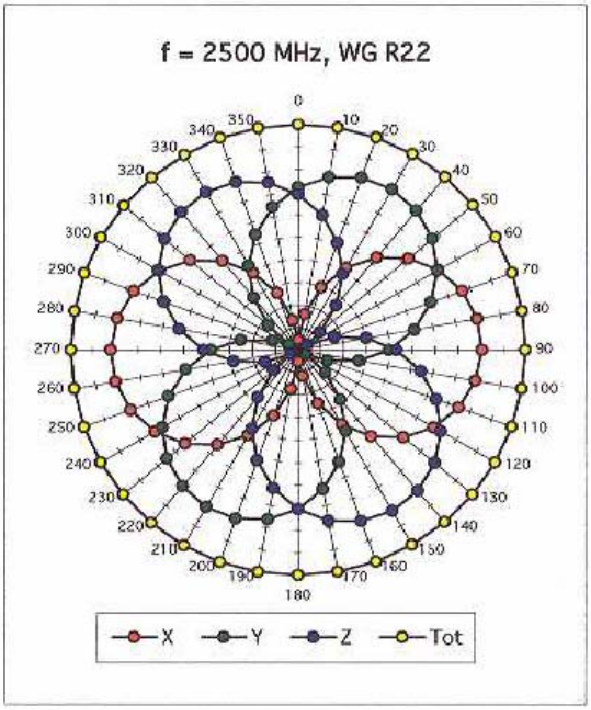
Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.4 ± 0.2	mm

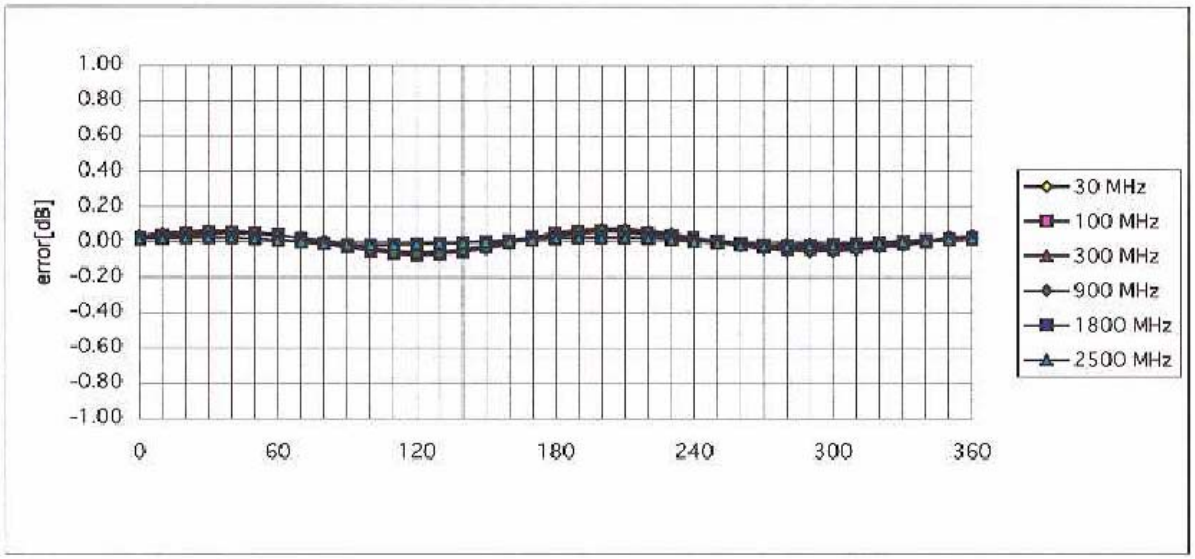
Receiving Pattern (ϕ), θ = 0°





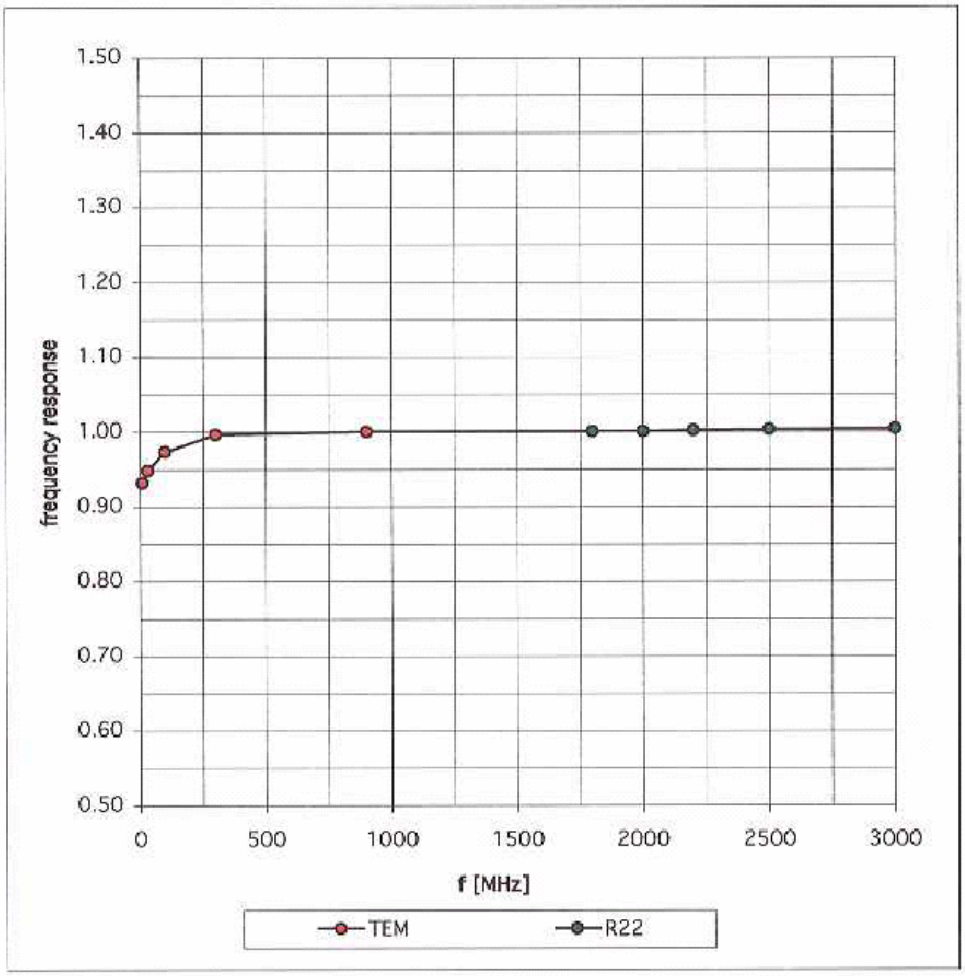


Isotropy Error (ϕ), θ = 0°



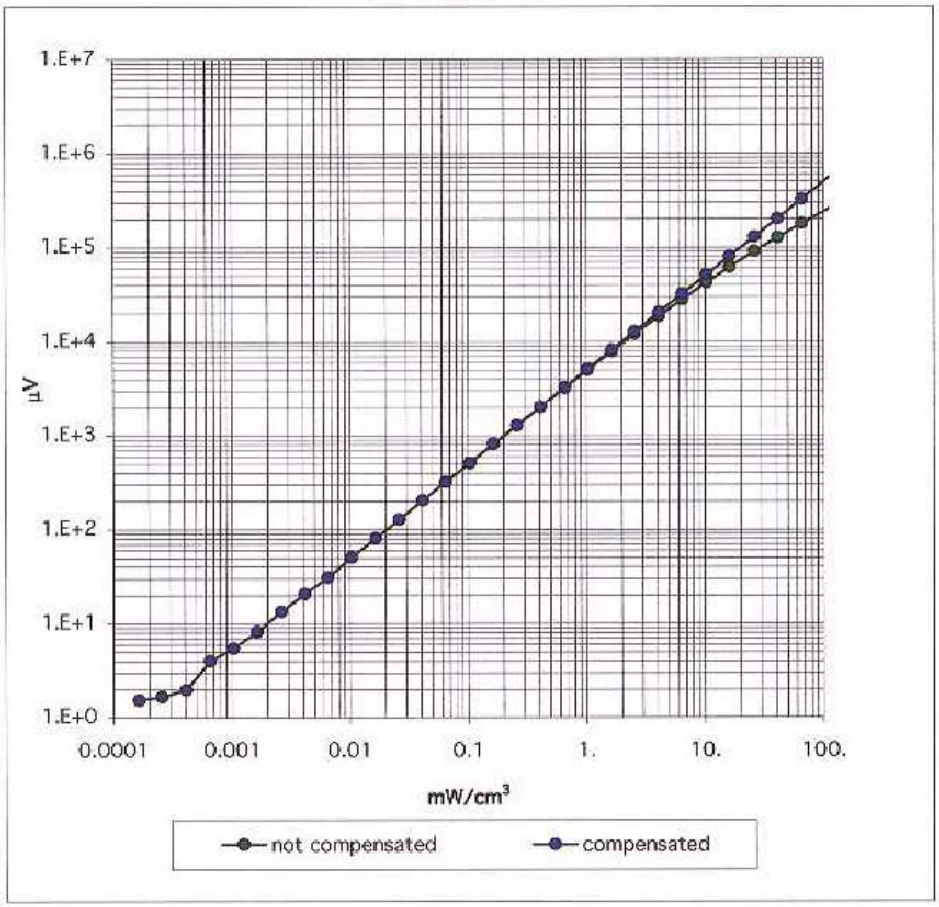
Frequency Response of E-Field

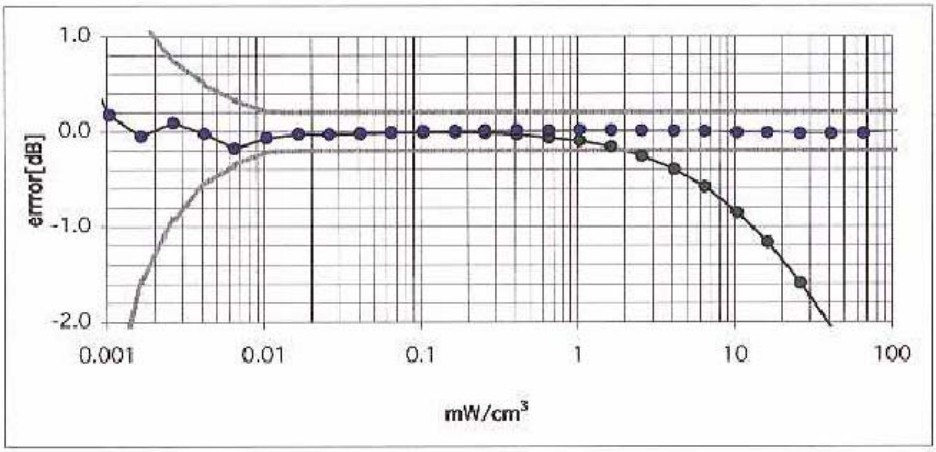
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SARhead)

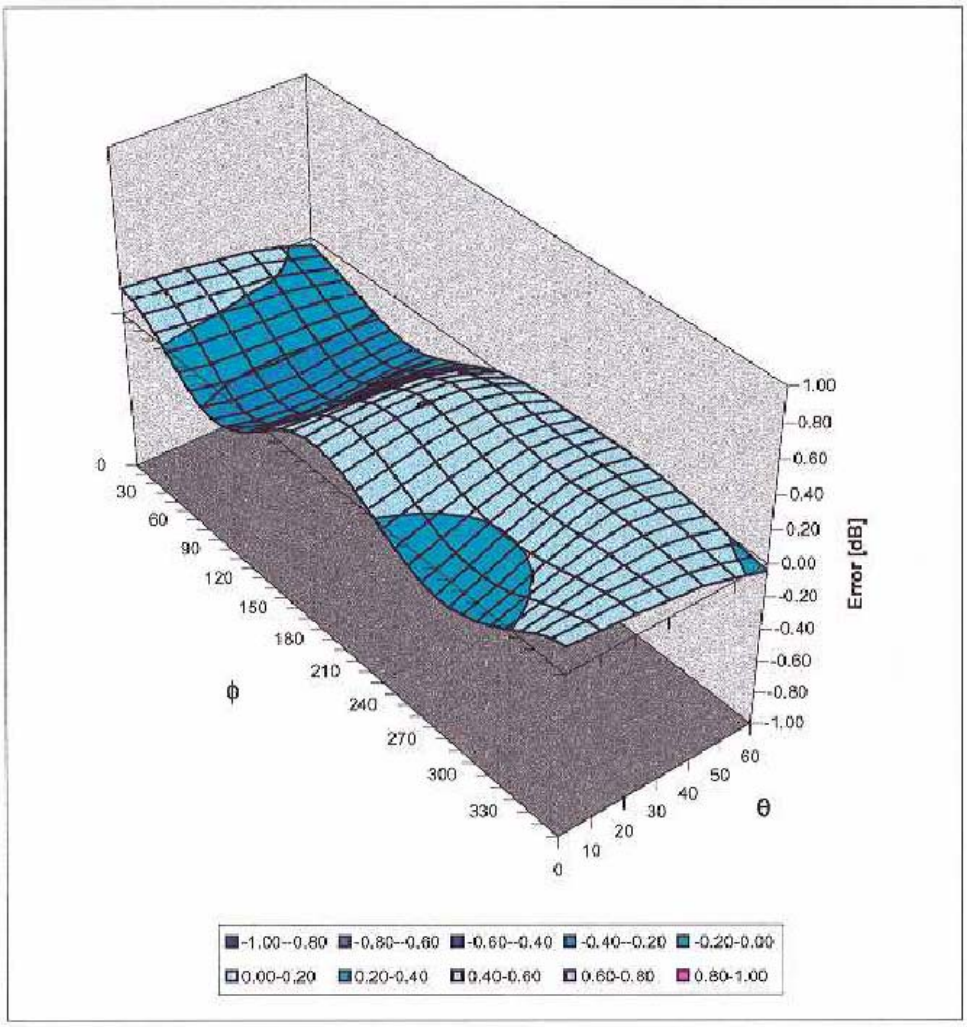
(Waveguide R22)





Deviation from Isotropy in HSL

Error (θ,φ), f = 900 MHz



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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1547**
Place of Assessment:	**Zurich**
Date of Assessment:	**September 23, 2003**
Probe Calibration Date:	**September 19, 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:

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

Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	7.8 ± 8%	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
236 MHz	ConvF	7.7 ± 8%	ε_r = 59.8 σ = 0.87 mho/m (body tissue)
300 MHz	ConvF	7.5 ± 8%	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
350 MHz	ConvF	7.5 ± 8%	ε_r = 57.7 σ = 0.93 mho/m (body tissue)
450 MHz	ConvF	7.2 ± 8%	ε_r = 56.7 σ = 0.94 mho/m (body tissue)
784 MHz	ConvF	6.3 ± 8%	ε_r = 55.4 σ = 0.97 mho/m (body tissue)
1450 MHz	ConvF	5.2 ± 8%	ε_r = 54.0 σ = 1.30 mho/m (body tissue)

Schmid & Partner Engineering AG

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Dosimetric E-Field Probe ET3DV6 SN:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.7 ± 8%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
236 MHz	ConvF	**7.9 ± 8%**	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz	ConvF	**7.5 ± 8%**	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz	ConvF	**7.5 ± 8%**	ε_r = 44.7 σ = 0.87 mho/m (head tissue)
400 MHz	ConvF	**7.2 ± 8%**	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz	ConvF	**7.2 ± 8%**	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz	ConvF	**6.5 ± 8%**	ε_r = 41.8 σ = 0.90 mho/m (head tissue)

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Engineering AG

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

Calibration Certificate

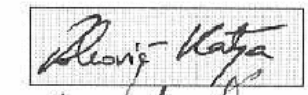
300 MHz System Validation Dipole

Type:	D300V2
Serial Number:	1001
Place of Calibration:	Zurich
Date of Calibration:	September 11, 2002
Calibration Interval:	24 months

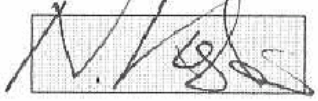
Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:



Approved by:



1. Measurement Conditions

The measurements were performed in the flat phantom filled with head simulating liquid of the following electrical parameters at 300 MHz:

Relative Dielectricity	**45.8**	± 5%
Conductivity	**0.93 mho/m**	± 5%

The DASY System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 8.5 at 300 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 and the dipole was oriented parallel to the longer side of the phantom. The standard measuring distance was 15mm from dipole center to the liquid surface including the 6mm thick phantom shell. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 20mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging.
The dipole input power (forward power) was 400 mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 1. The results have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**2.83 mW/g** (Advanced Extrapolation)
averaged over 10 cm^3 (10 g) of tissue:	**1.89 mW/g** (Advanced Extrapolation)

Advanced extrapolation has been applied to the measured SAR values to compensate for the probe boundary effect (see DASY User Manual for details).

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well.

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:	**1.737 ns**	(one direction)
Transmission factor:	**0.995**	(voltage transmission, one direction)

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

Feedpoint impedance at 300 MHz:	Re{Z} = **56.9 Ω**
	Im {Z} = **-5.9 Ω**
Return Loss at 300 MHz	**-21.6 dB**

4. 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.

5. 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.

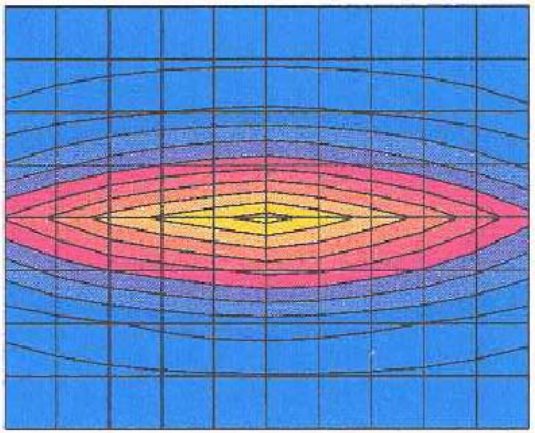
6. Power Test

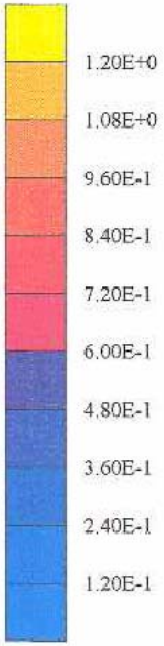
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

09/11/02

Validation Dipole D300V2 SN:1001, d = 15 mm

Frequency: 300 MHz; Antenna Input Power: 400 [mW], Flat Phantom (shell thickness = 6mm)
Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(8.50,8.50,8.50); Crest factor: 1.0; Head 300 MHz: σ = 0.93 mho/m ε_r = 45.8 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.74 mW/g ± 0.02 dB, SAR (1g): 1.13 mW/g ± 0.02 dB, SAR (10g): 0.755 mW/g ± 0.01 dB , (Advanced extrapolation)
Penetration depth: 12.9 (11.6, 14.6) [mm]





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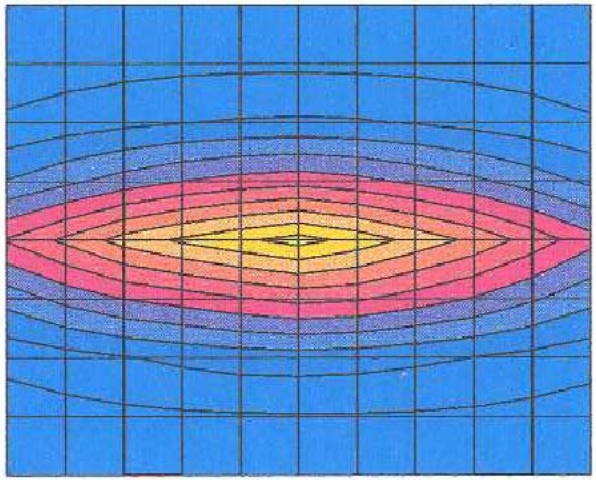
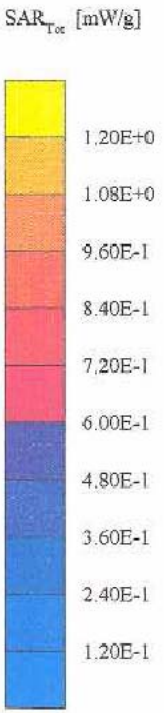
09/11/02

Validation Dipole D300V2 SN:1001, d = 15 mm

Frequency: 300 MHz; Antenna Input Power: 400 [mW], Flat Phantom (shell thickness = 6mm)
Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(8.50,8.50,8.50); Crest factor: 1.0; Head 300 MHz: σ = 0.93 mho/m ε_r = 45.8 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.89 mW/g ± 0.02 dB, SAR (1g): 1.19 mW/g ± 0.02 dB, SAR (10g): 0.779 mW/g ± 0.01 dB , (Worst-case extrapolation)
Penetration depth: 12.3 (10.7, 14.4) [mm]





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APPENDIX E

Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: ABZ99FT3039. The sample that was used in the following photos represents the product used to obtain the results presented herein and was used in this section to demonstrate the different body-worn accessories.

Photo 1.
Model HLN8255B
Back View

Photo 2.
Model HLN8255B
Side View

Photo 3.
Model HLN9701B
Back View

Photo 4.
Model HLN9701B
Side View

Photo 5.
Model HLN9701B
Front View

Photo 6.
Model RLN5383A
Back View

Photo 7.
Model RLN5383A
Side View

Photo 8.
Model RLN5383A
Front View

Photo 9.
Model RLN5385A
Back View

Photo 10.
Model RLN5385A
Side View

Photo 11.
Model RLN5385A
Front View

Photo 12.
Model RLN5644A
Back View

Photo 13.
Model RLN5644A
Side View

Photo 14.
Models HLN6602A, NTN5243A

Photo 15.
Model RLN5497A
Back view

Photo 16.
Model RLN5497A
Side view

Photo 17.
Model RLN5497A
Front view

Photo 17.
Model RLN5498A
Back view

Photo 18.
Model RLN5498A
Side view

Photo 19.
Model RLN5498A
Front view

Appendix F
Accessories and options test status and separation distances

The following table summarizes the test status and separation distance provided by each of the applicable accessories:

Carry Case Model	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
HLN6602A	Yes	10-24	NA
NTN5243A	Yes	NA	Tested with carry case RLN5383A
HLN8255B	Yes	34-54	NA
HLN9701B	Yes	40-57	NA
RLN5383A	Yes	50-77	NA
RLN5385A	Yes	53-70	NA
RLN5644A	Yes	35-56	NA
RLN5497A	Yes	62-96	NA
RLN5498A	Yes	42-60	Na
RLN5496A	No	62-96	Similar to RLN5497A
RLN5384A	No	53-70	Similar to RLN5385A
RLN4570A	No	10-24	Similar to HLN6602A
HLN9985B	No	NA	Water proof bag. Product not functional in this carry case

Audio Acc. Model	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
HMN9030A	Yes	NA	NA
HMN9754D	Yes	NA	NA
HMN9013A	Yes	NA	NA
HLN9133A	Yes	NA	Tested w/ PMLN4443A
RMN4016A	Yes	NA	NA
RLN5238A	Yes	NA	NA
HMN9021A	Yes	NA	NA
BDN6647F	Yes	NA	NA
BDN6648C	Yes	NA	NA
RMN5015A	Yes	NA	NA
RKN4090A	Yes	NA	tested with RMN5015A
RLN5411A	Yes	NA	NA
PMMN4008A	Yes	NA	NA
PMLN4443A	Yes	NA	NA
PMLN4445A	Yes	NA	NA
PMLN4294C	Yes	NA	NA

PMLN4442A	Yes	NA	NA
BDN6706B	Yes	NA	NA
0180358B38	Yes	NA	Tested w/ BDN6706B
RMN4054B	Yes	NA	NA
RMN4055A	Yes	NA	NA
RMN4051B	Yes	NA	NA
RKN4094A	Yes	NA	Tested w/ RMN4051B
HLN9132A	Yes	NA	Receive only
PMMN4001A	Yes	NA	NA
HMN9727B	Yes	NA	Receive only
HMN9752B	Yes	NA	Receive only
BDN6720A	Yes	NA	Receive only
RLN4894A	No	NA	Similar to HMN9727B
BDN6646C	No	NA	Similar to BDN6706B
0180300E83	No	NA	Similar to 0180358B38
RLN4895A	No	NA	Similar to HMN9754D
HMN9036A	No	NA	Similar to HMN9754D
RLN5198AP	No	NA	Similar to HMN9754D
HMN9022A	No	NA	Similar to HMN9021A
0180358B33	No	NA	Ear holder only
NTN8370A	No	NA	Extreme noise kit. Mechanical piece
NTN8371A	No	NA	Low noise kit. Mechanical piece
RLN4764A	No	NA	Foam piece

Additional attachments	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
5886627Z01	Yes	NA	Tested with standard antenna model HAD9338AR