Certificate Number: 1449-01

MOTOROLA

ACCREDITED

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

S.A.R. EME Compliance Test Report
Part 2 of 2

Date of Report:	August 6, 2004
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	XTS Portable UHF digital; 380-470MHz, 1.0-5.0 watts nominal
FCC ID:	**AZ489FT4865**
Device Model:	H66QDC9PW5AN

Test Period:	7/27/04 - 8/02/04
EME Tech:	Ed Church
Responsible Eng:	Deanna Zakharia (Elect. Principle Staff Eng.)
Author:	Michael Sailsman (Global EME Regulatory Affairs Liaison)

Note: Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report.

Signature on File — Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab

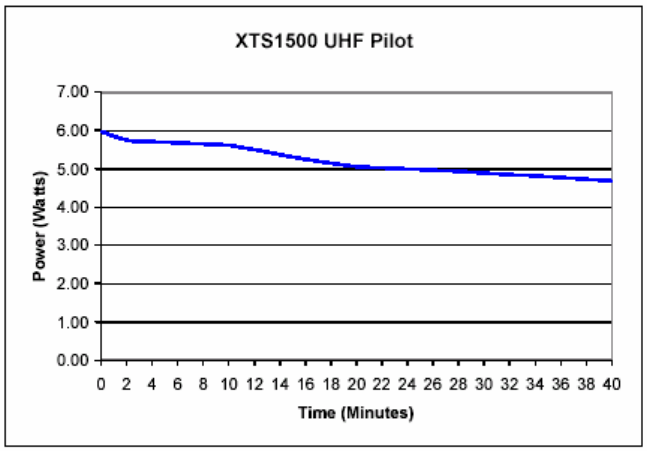
8/9/04 — Date Approved

APPENDIX A

Power Slump Data/Shortened Scan

DUT Power versus time data

Time (Minutes)	Pilot Radio 407TDY7007 Battery NTN9857B
0	5.98
2	5.75
4	5.70
6	5.67
8	5.65
10	5.62
12	5.50
14	5.37
16	5.24
18	5.14
20	5.06
22	5.02
24	4.99
26	4.96
28	4.93
30	4.89
32	4.85
34	4.81
36	4.77
38	4.73
40	4.68



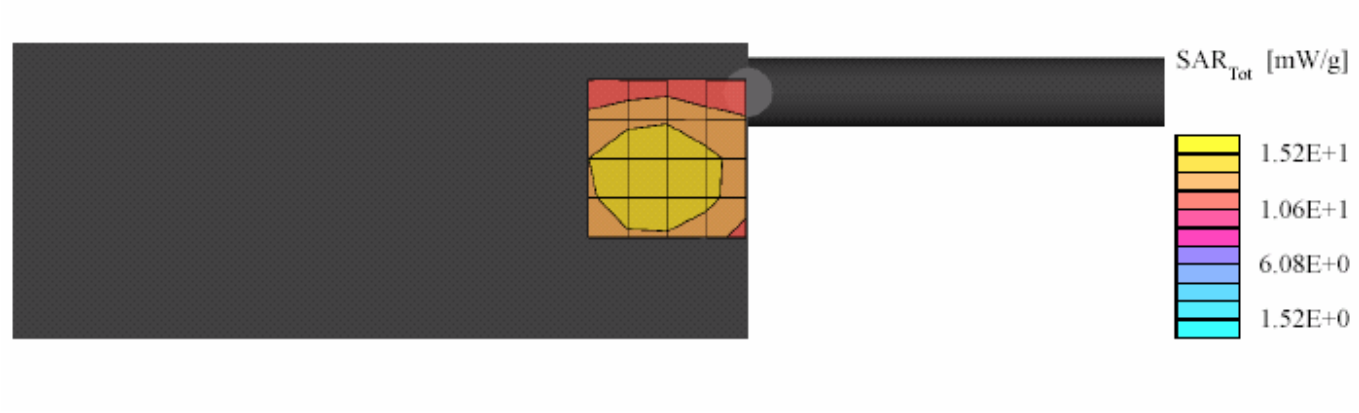
Shortened Scan Results

FCC ID: AZ489FT4865; Test Date: 7/30/04
Motorola CGISS EME Laboratory
Run #: EC-Ab-R1-040730-23
Model #: H66QDC9PW5AN SN: 407TDY7007
TX Freq: 407.225 MHz
Sim Tissue Temp: 20.4 (Celsius)
Start Power : 6.09 W

Antenna: NAE6546AR
Battery Kit: NTN9857B
Carry Acc: HLN6853A
Audio/Data Acc.: NTN1625A

Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.
Representative "normal" scan run time was 26 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 5.96 mW/g; 10-g Avg. = 4.29mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 5.57mW/g; 10-g Avg. = 4.03mW/g
(see section 7.1 run # EC-Ab-R1-040730-22)

DUT with belt clip against phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1384(Cal Date 27 May 04); ConvF(7.60,7.60,7.60); Probe cal date: 27/5/04; Crest factor: 1.0; FCC Body 425 MHz: σ = 0.93 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE SN: 363 DAE Cal Date: 05/26/04
Cube 5x5x7: SAR (1g): 10.8 mW/g, SAR (10g): 7.77 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 10.8 mW/g, SAR (10g): 7.77 mW/g
Power Drift: -0.43 dB

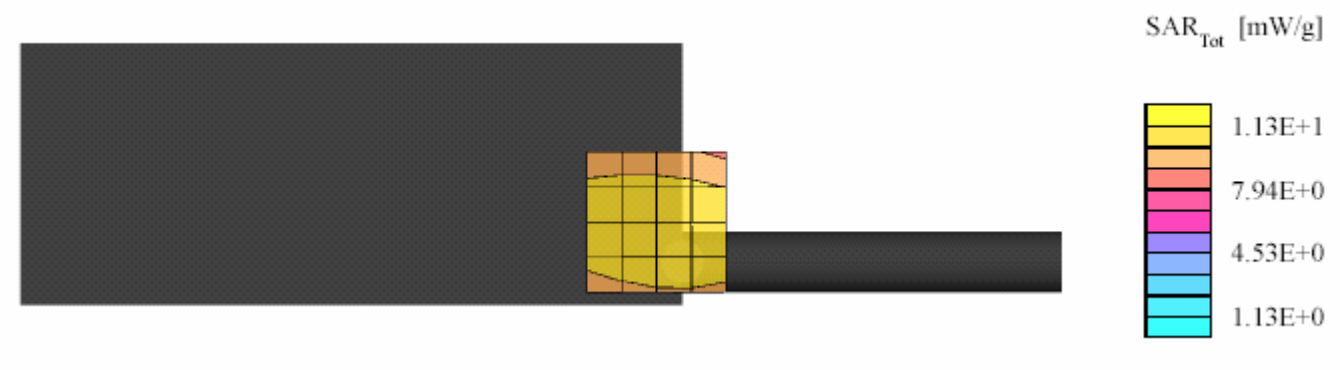


FCC ID: AZ489FT4865; Test Date: 8/02/04
Motorola CGISS EME Laboratory
Run #: DZ-Face-R1-040802-03
Model #: H66QDC9PW5AN SN: 407TDY7007
TX Freq: 407.225 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power: 6.11 W

Antenna: NAE6546AR
Battery Kit: NTN9857B
Carry case: None
Audio/Data Acc.: None

Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.
Representative "normal" scan run time was 26 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 4.12 mW/g; 10-g Avg. = 3.06mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 4.17mW/g; 10-g Avg. = 3.10mW/g
(see section 7.1 run # DZ-Face-R1-040802-02)

DUT with front towards the phantom with 2.5cm separation
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1384(Cal Date 27 May 04); ConvF(7.60,7.60,7.60); Probe cal date: 27/5/04; Crest factor: 1.0; IEEE
Head 425 MHz: σ = 0.86 mho/m ε = 45.1 ρ = 1.00 g/cm3; DAE SN: 363 DAE Cal Date: 05/26/04
Cube 5x5x7: SAR (1g): 8.23 mW/g, SAR (10g): 6.11 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 8.23 mW/g, SAR (10g): 6.11 mW/g
Power Drift: 0.01 dB

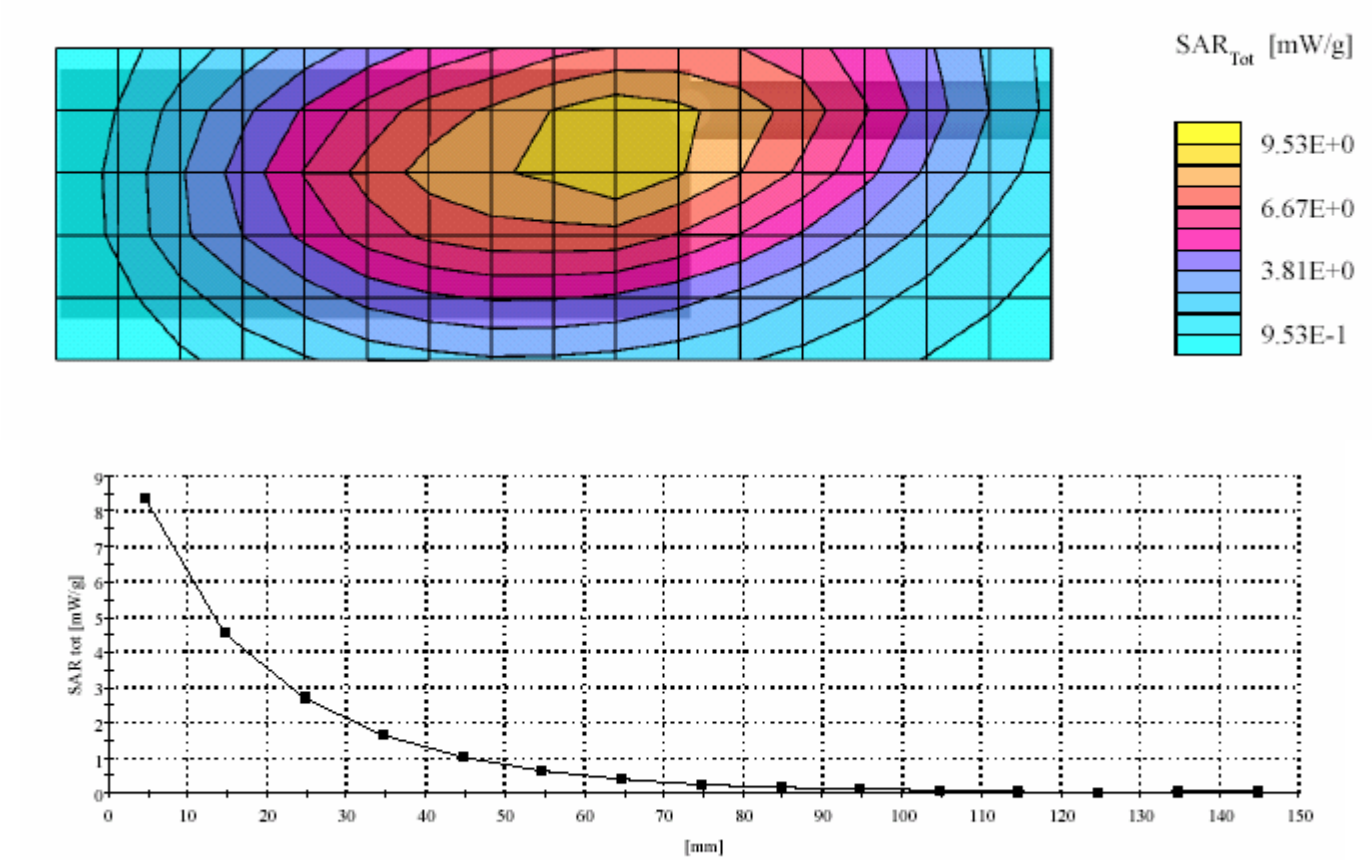


APPENDIX B
Data Results

FCC ID: AZ489FT4865; Test Date: 7/30/04
Motorola CGISS EME Laboratory
Run #: EC-Ab-R1-040730-22
Model #: H66QDC9PW5AN SN: 407TDY7007
TX Freq: 407.225 MHz
Sim Tissue Temp: 20.4 (Celsius)
Start Power: 6.16 W

Antenna: NAE6546AR
Battery Kit: NTN9857B
Carry Acc: HLN6853A
Audio/Data Acc.: NTN1625A

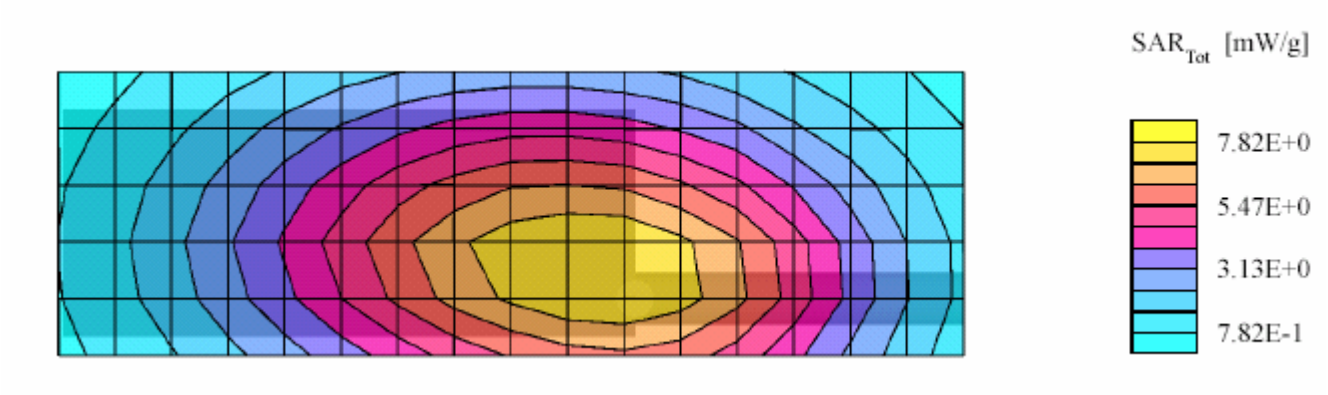
DUT with belt clip against the phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1384(Cal Date 27 May 04); ConvF(7.60,7.60,7.60); Probe cal date: 27/5/04; Crest factor: 1.0; FCC Body 425 MHz: σ = 0.93 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE SN: 363 DAE Cal Date: 05/26/04
Cube 7x7x7: SAR (1g): 8.63 mW/g, SAR (10g): 6.24 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 24.0, 135.0, 4.7
Power Drift: -1.11 dB
Note: "Max outside" has been identified by SPEAG as an unresolved intermittent occurrence with the DASY 3 application even when the entire peak area is captured.

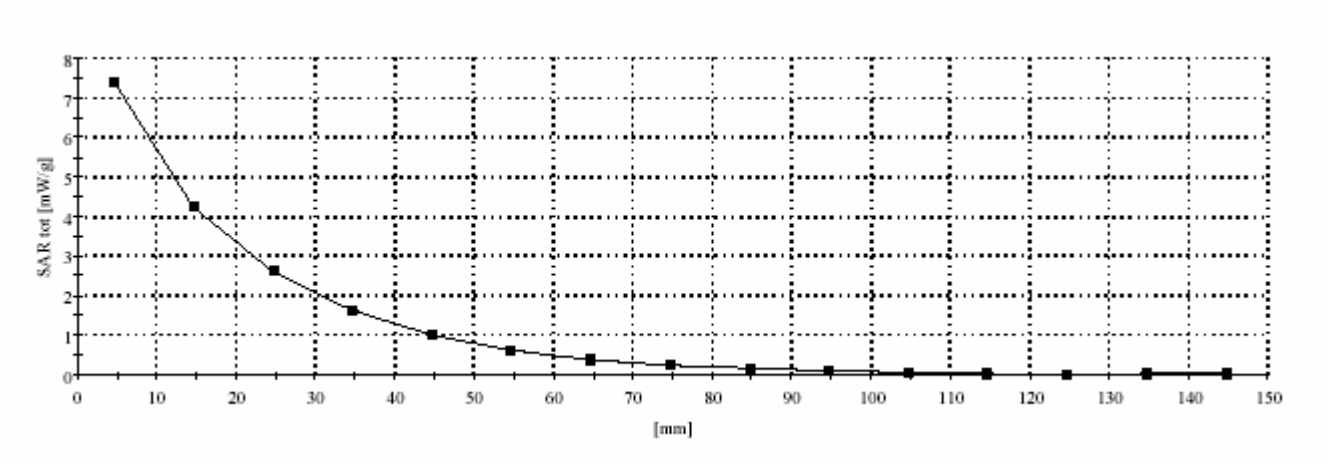


FCC ID: AZ489FT4865; Test Date: 8/2/04
Motorola CGISS EME Laboratory
Run #: DZ-Face-R1-040802-02
Model #: H66QDC9PW5AN SN: 407TDY7007
TX Freq: 407.225 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power : 6.15 W

Antenna: NAE6546AR
Battery Kit: NTN9857B
Carry Acc: NONE
Audio/Data Acc.: NONE

DUT with front towards the phantom with 2.5cm separation
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6 - SN1384(Cal Date 27 May 04); ConvF(7.60,7.60,7.60); Probe cal date: 27/5/04; Crest factor: 1.0; IEEE
Head 425 MHz: σ = 0.86 mho/m ε = 45.1 ρ = 1.00 g/cm3; DAE SN: 363 DAE Cal Date: 05/26/04
Cube 5x5x7: SAR (1g): 7.63 mW/g, SAR (10g): 5.67 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 52.5, 144.0, 4.7
Power drift: -0.39 dB





APPENDIX C

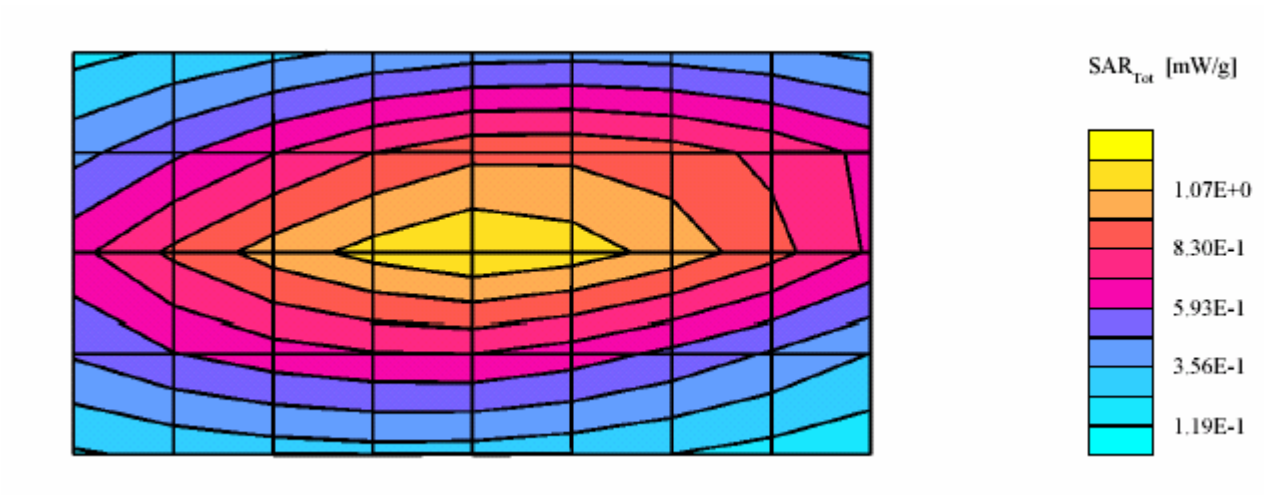
Dipole System Performance Check Results

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 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 7/27/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040727-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.3 C
Start Power: 250mW

Target: 4.71 mW/g for 1g SAR 3.11 mW/g for 10g SAR
SAR Calculated 1g is 4.80 mW/g percent from target (including drift) is + 1.91%
SAR Calculated 10g is 3.16 mW/g Percent from target (including drift) is + 1.61 %

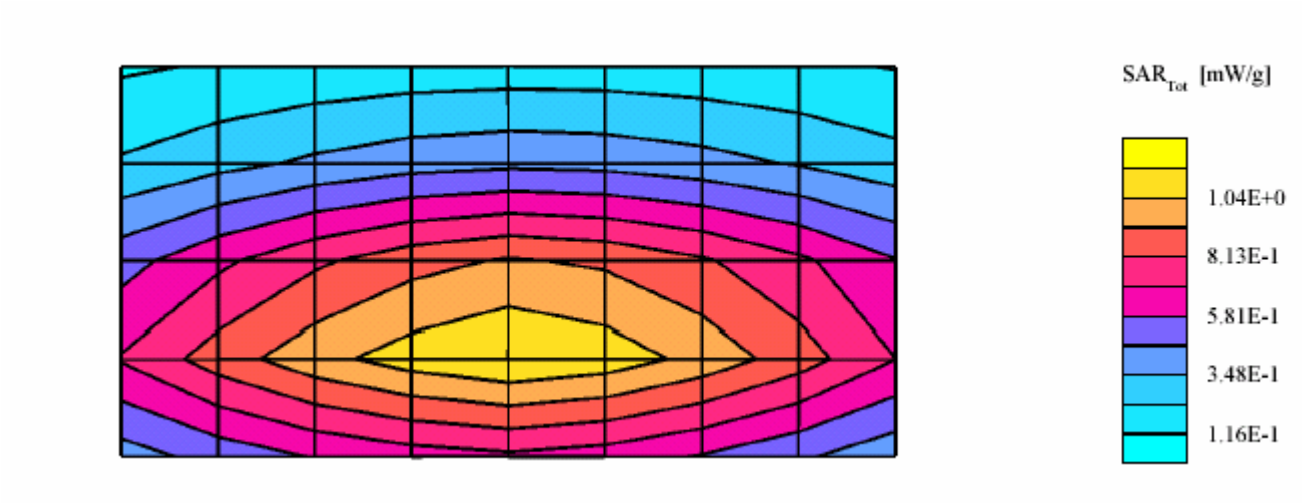
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; FCC Body 450 MHz: σ = 0.94 mho/m ε = 55.0 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.85 mW/g ± 0.01 dB, SAR (1g): 1.20 mW/g ± 0.01 dB, SAR (10g): 0.790 mW/g ± 0.01 dB, (Worst-case extrapolation)Penetration depth: 12.7 (11.3, 14.4) [mm]
Power drift: 0.00 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 7/28/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040728-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.8 C
Start Power: 250mW

Target: 4.71 mW/g for 1g SAR 3.11 mW/g for 10g SAR
SAR Calculated 1g is 4.77 mW/g percent from target (including drift) is + 1.37%
SAR Calculated 10g is 3.16 mW/g Percent from target (including drift) is + 1.61 %

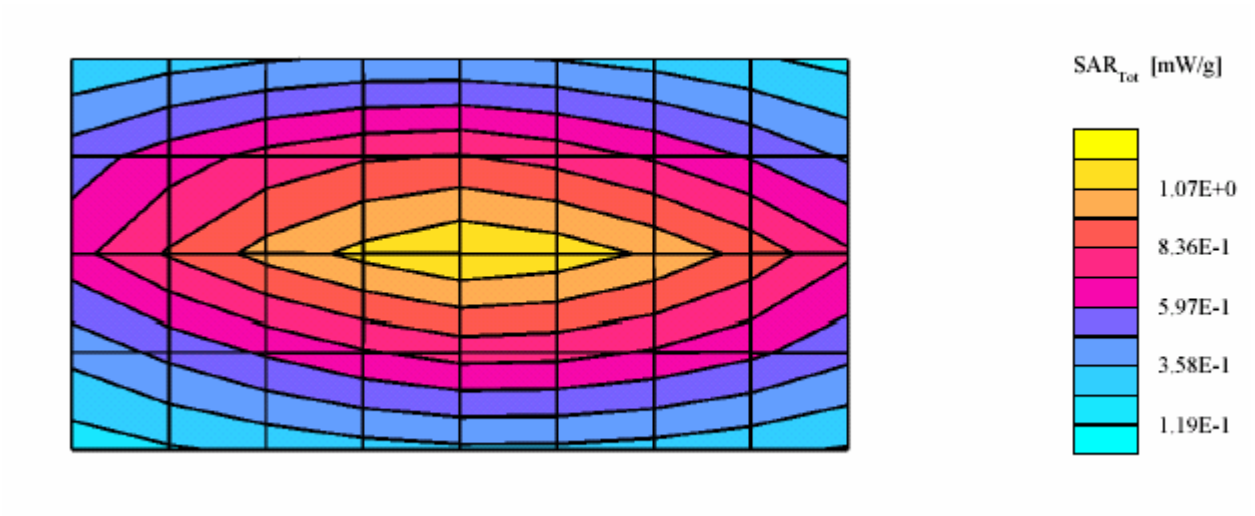
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; FCC Body 450 MHz: σ = 0.94 mho/m ε = 54.8 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.84 mW/g ± 0.02 dB, SAR (1g): 1.18 mW/g ± 0.01 dB, SAR (10g): 0.781 mW/g ± 0.00 dB, (Worst-case extrapolation)Penetration depth: 12.6 (11.3, 14.3) [mm]
Power drift: -0.05 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 7/29/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040729-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.8 C
Start Power: 250mW

Target: 4.71 mW/g for 1g SAR 3.11 mW/g for 10g SAR
SAR Calculated 1g is 4.72 mW/g percent from target (including drift) is + 0.21%
SAR Calculated 10g is 3.12 mW/g Percent from target (including drift) is + 0.45 %

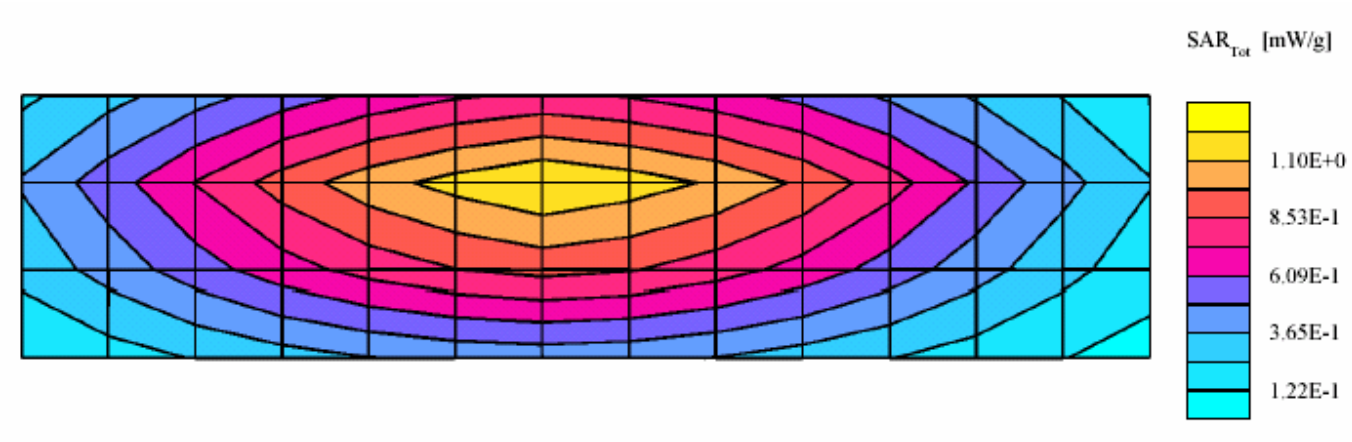
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; FCC Body 450 MHz: σ = 0.97 mho/m ε = 55.4 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.83 mW/g ± 0.02 dB, SAR (1g): 1.18 mW/g ± 0.02 dB, SAR (10g): 0.781 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.6 (11.3, 14.2) [mm]
Power drift: 0.00 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 7/30/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040730-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.5 C
Start Power: 250mW

Target: 4.71 mW/g for 1g SAR 3.11 mW/g for 10g SAR
SAR Calculated 1g is 4.85 mW/g percent from target (including drift) is +3.00 %
SAR Calculated 10g is 3.18 mW/g Percent from target (including drift) is +2.23 %

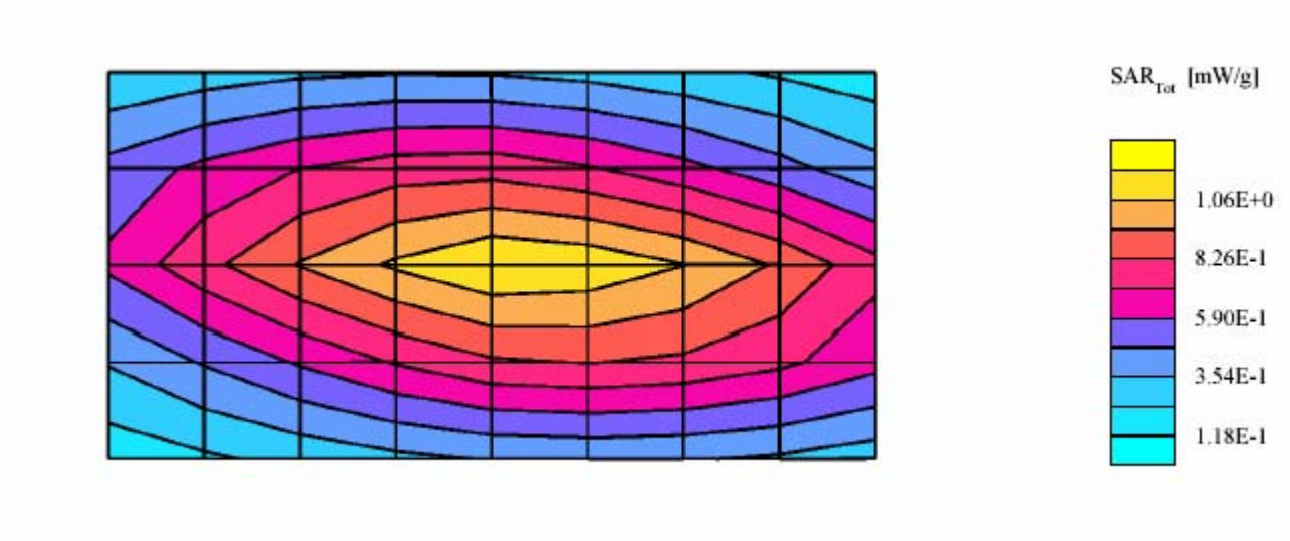
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; FCC Body 450 MHz: $\sigma = 0.96$ mho/m $\varepsilon = 55.1$ $\rho = 1.00$ g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.88 mW/g ± 0.01 dB, SAR (1g): 1.21 mW/g ± 0.01 dB, SAR (10g): 0.793 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.3 (11.1, 14.0) [mm]
Power drift: -0.01 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 7/31/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040731-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.7 C
Start Power: 250mW

Target: 4.71 mW/g for 1g SAR 3.11 mW/g for 10g SAR
SAR Calculated 1g is 4.63 mW/g percent from target (including drift) is - 1.71 %
SAR Calculated 10g is 3.07 mW/g Percent from target (including drift) is - 1.19 %

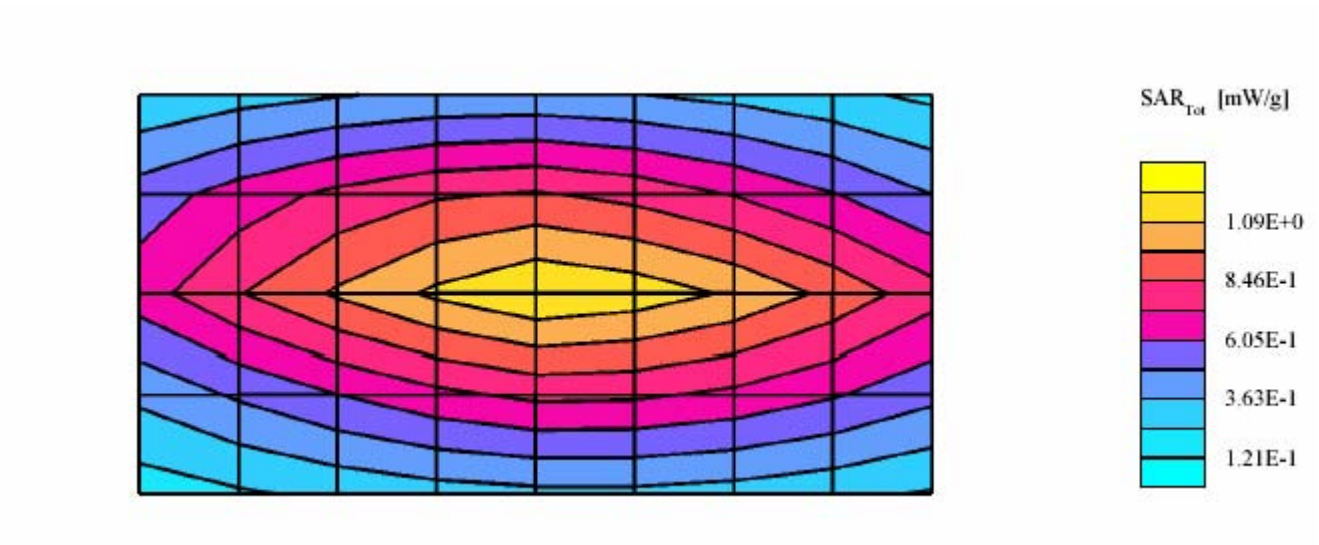
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; FCC Body 450 MHz: σ = 0.93 mho/m ε = 54.7 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.80 mW/g ± 0.03 dB, SAR (1g): 1.16 mW/g ± 0.02 dB, SAR (10g): 0.770 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.6 (11.3, 14.3) [mm]
Power drift: 0.01 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 8/1/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040801-01
TX Freq: 450 MHz
Sim Tissue Temp: 20.7 C
Start Power: 250mW

Target: 4.73 mW/g for 1g SAR 3.12 mW/g for 10g SAR
SAR Calculated 1g is 4.87 mW/g percent from target (including drift) is + 2.89 %
SAR Calculated 10g is 3.19 mW/g Percent from target (including drift) is + 2.17 %

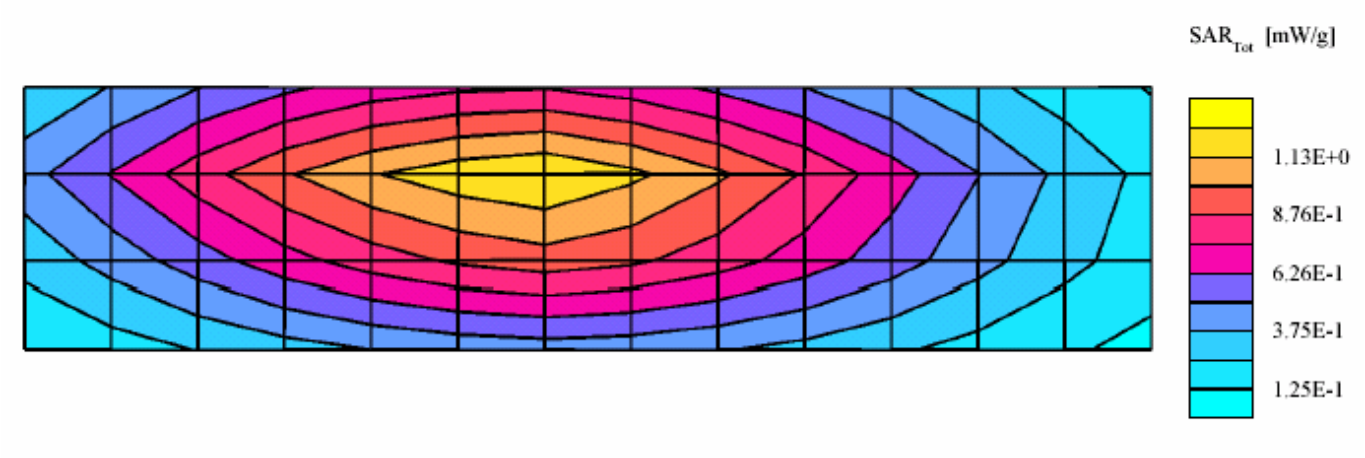
Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; IEEE Head 450MHz: σ = 0.86 mho/m ε = 44.3 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.86 mW/g ± 0.02 dB, SAR (1g): 1.20 mW/g ± 0.01 dB, SAR (10g): 0.786 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.3, 14.2) [mm]
Power drift: -0.06 dB



SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 8/2/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040802-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.1 C
Start Power: 250mW

Target: 4.73 mW/g for 1g SAR 3.12 mW/g for 10g SAR
SAR Calculated 1g is 4.99 mW/g percent from target (including drift) is +5.47 %
SAR Calculated 10g is 3.28 mW/g Percent from target (including drift) is +5.14 %

Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 27 May 04);Probe Cal Date: 27/5/04ConvF(7.40,7.40,7.40); Crest factor: 1.0; IEEE Head 450MHz: σ = 0.89 mho/m ε = 44.7 ρ = 1.00 g/cm3; DAE3: SN:363 Cal Date: (5/26/04)
Cubes (2): Peak: 1.94 mW/g ± 0.00 dB, SAR (1g): 1.25 mW/g ± 0.00 dB, SAR (10g): 0.822 mW/g ± 0.00 dB, (Worst-case extrapolation)Penetration depth: 12.7 (11.3, 14.4) [mm]
Power drift: 0.01 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	4/14/2004	Frequency (MHz):	450
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	2	Ambient Temp.(°C):	23
Probe Serial #:	1545	Tissue Temp.(°C):	20.6
DAE Serial #:	374		

Tissue Characteristics

Permitivity:	56.3	Phantom Type/SN:	80302002A/S8
Conductivity:	0.94	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	D450V2 (Dipole)
Reference SN:	1002

Power to Dipole: 250 mW

Measured SAR Value:	1.17	mW/g,	0.773	mW/g (10g avg.)
Power Drift:	-0.03	dB		

New Target/Measured SAR Value:	4.71	mW/g,	3.11	mW/g (10g avg.)
(normalized to 1.0 W, including drift)				

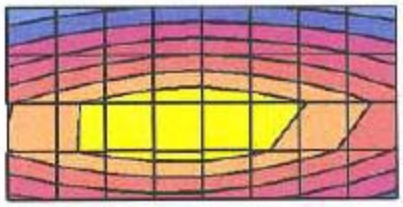
Test performed by: C. Miller Initial:

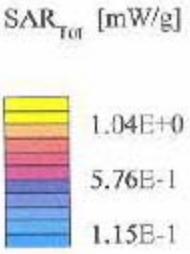
Sys. Per. Chk. Form: 021024

Dipole D450V2 SN1002; Test date:04/14/04

Run #: Sys Perf R2-040414-02 Phantom #: 80302002B/S6
Model #: D450V2 SN: 1002
Robot: CGISS-2 DAE3: SN: 374 (3/23/04) Tester: C Miller
TX Freq: 450 MHz Sim Tissue Temp: 20.6 C
Start Power: 250mW

SAR calculated 1g is 4.71 mW/g
SAR Calculated 10g is 3.11 mW/g
Flat (2); Probe: ET3DV6R - SN1545(cal Date 28 Aug 2003); ConvF(7.00,7.00,7.00); Crest factor: 1.0; FCC Body 450: $\sigma = 0.94$ mho/m $\varepsilon_r = 56.3$ $\rho = 1.00$ g/cm^3
Cubes (2): Peak: 1.79 mW/g ± 0.09 dB, SAR (1g): 1.17 mW/g ± 0.08 dB, SAR (10g): 0.773 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 13.0 (11.5, 14.8) [mm]
Powerdrift: -0.03 dB





Motorola CGISS EME Lab

SYSTEM VALIDATION

Date:	4/14/2004	Frequency (MHz):	450
Lab Location:	CGISS	Mixture Type:	IEEE-Head
Robot System:	2	Ambient Temp.(°C):	23
Probe Serial #:	1545	Tissue Temp.(°C):	20.6
DAE Serial #:	374		

Tissue Characteristics

Permitivity:	44.3	Phantom Type/SN:	80302002C/S6
Conductivity:	0.86	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	D450V2	(Dipole)
Reference SN:	1002	

Power to Dipole:	250	mW
Power Output (radio):	n/a	mW

Target SAR Value: (normalized to 1.0 W)	4.9	mW/g,	3.3	mW/g (10g avg.)
Measured SAR Value:	1.18	mW/g,	0.778	mW/g (10g avg.)
Power Drift:	-0.01	dB		
Measured SAR Value: (normalized to 1.0 W, including drift)	4.73	mW/g,	3.12	mW/g (10g avg.)

Percent Difference From Target (MUST be within System Uncertainty): 3.45 % (1g ave)
5.48 % (10g ave)

Test performed by: C. Miller Initial:

Motorola Internal Use Only

Sys. Valid. Form: 021024

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	4/14/2004	Frequency (MHz):	450
Lab Location:	CGISS	Mixture Type:	IEEE - Head
Robot System:	2	Ambient Temp.(°C):	23
Probe Serial #:	1545	Tissue Temp.(°C):	20.6
DAE Serial #:	374		
Tissue Characteristics			
Permitivity:	44.3	Phantom Type/SN:	80302002C/S7
Conductivity:	0.86	Distance (mm):	15 (tissue/dipole cnt)
Reference Source:	D450V2	(Dipole)	
Reference SN:	1002		

Power to Dipole: 250 mW

Measured SAR Value:	1.18	mW/g,	0.778	mW/g (10g avg.)
Power Drift:	-0.01	dB		
New Target/Measured SAR Value: (normalized to 1.0 W, including drift)	4.73	mW/g,	3.12	mW/g (10g avg.)

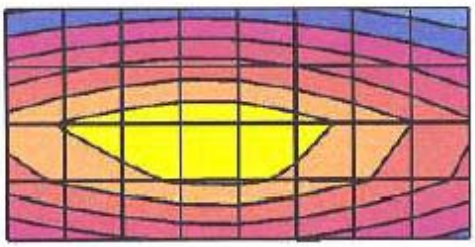
Test performed by: C. Miller Initial: CM

Sys. Per. Chk. Form: 021024

Dipole D450V2 SN1002; Test date:04/14/04

Run #: Sys PerfR2-040414-01 Phantom #: 80302002B/S6
Model #: D450V2 SN: 1002
Robot: CGISS-2 DAE3: SN: 374 (3/23/04) Tester: C Miller
TX Freq: 450 MHz Sim Tissue Temp: 20.6 C
Start Power: 250mW

SAR calculated 1g is 4.73 mW/g
SAR Calculated 10g is 3.12 mW/g
Flat (2); Probe: ET3DV6R - SN1545(cal Date 28 Aug 2003); ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 450 MHz: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.3$ $\rho = 1.00$ g/cm^3
Cubes (2): Peak: 1.83 mW/g ± 0.08 dB, SAR (1g): 1.18 mW/g ± 0.07 dB, SAR (10g): 0.778 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 12.6 (11.3, 14.4) [mm]
Powerdrift: -0.01 dB



Motorola CGISS EME Lab

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:1384
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	May 27, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
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 (SPEAG, in house check Oct-03)	In house check: Oct 05
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 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: May 27, 2004

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:1384

Sensitivity in Free Space

Diode Compression[A]

NormX	1.78 μV/(V/m)^2	DCP X	92	mV
NormY	1.76 μV/(V/m)^2	DCP Y	92	mV
NormZ	1.91 μV/(V/m)^2	DCP Z	92	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR_{be} [%]	Without Correction Algorithm	9.9	4.9
SAR_{be} [%]	With Correction Algorithm	0.1	0.4

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

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR_{be} [%]	Without Correction Algorithm	14.1	9.0
SAR_{be} [%]	With Correction Algorithm	0.3	0.1

Sensor Offset

Probe Tip to Sensor Center	2.7 mm
Optical Surface Detection	in tolerance

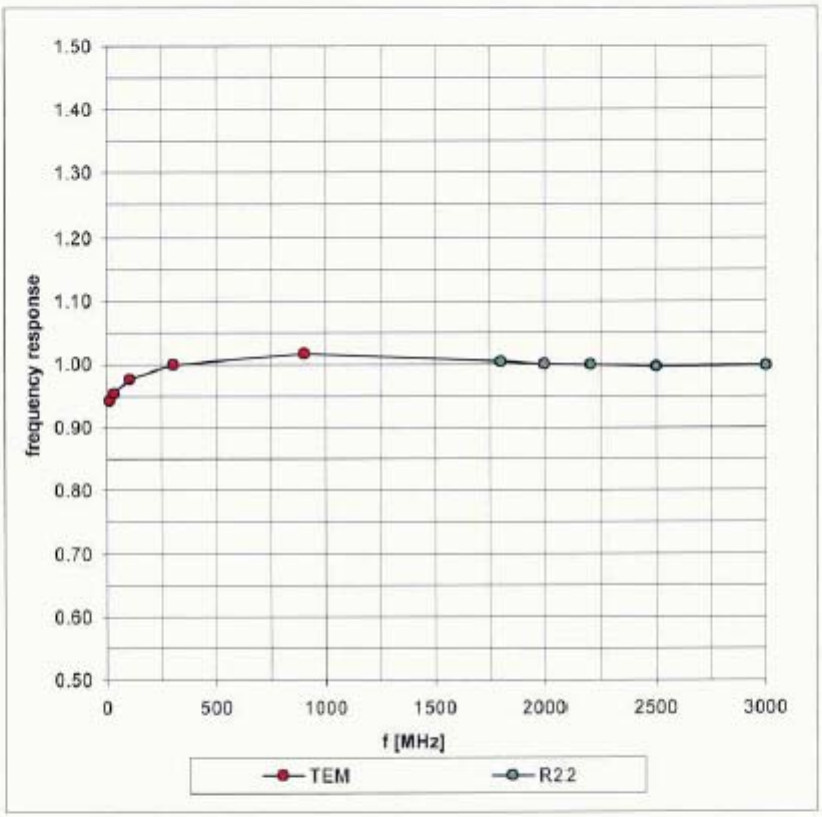
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] numerical linearization parameter: uncertainty not required

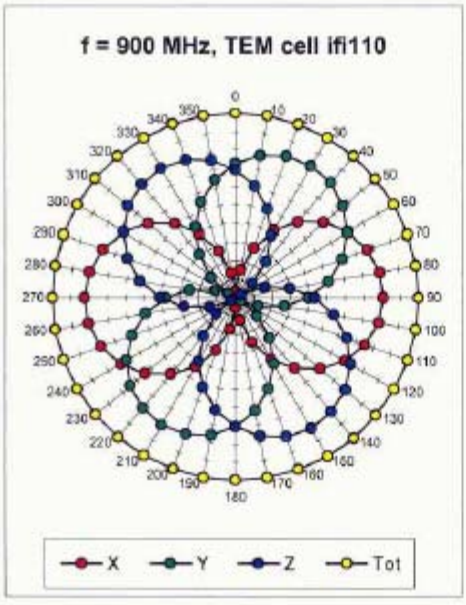
ET3DV6 SN:1384 May 27, 2004

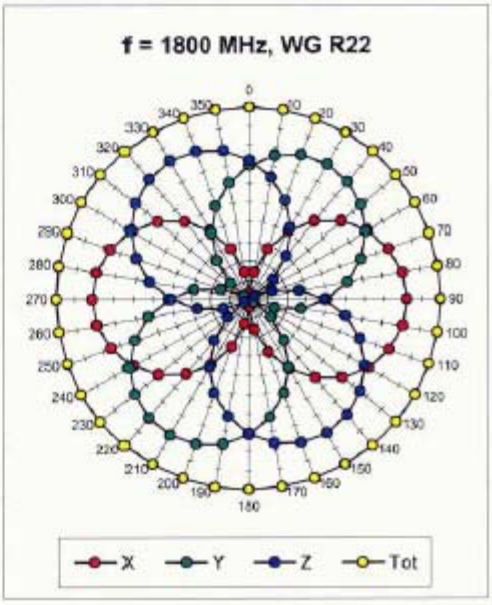
Frequency Response of E-Field

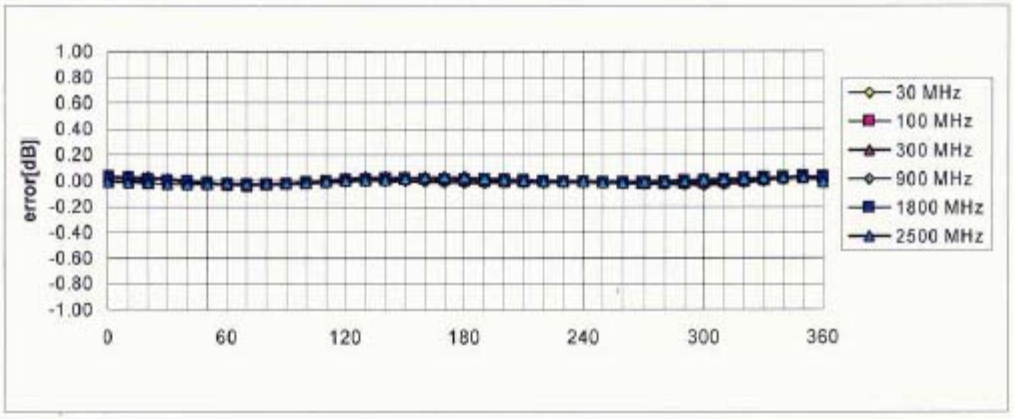
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ), θ = 0°



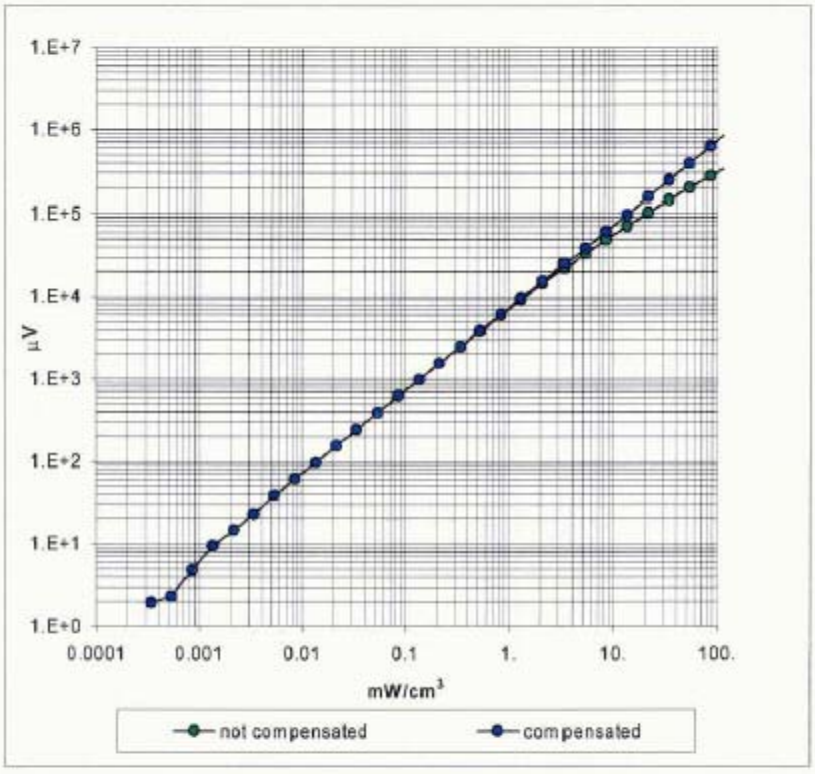


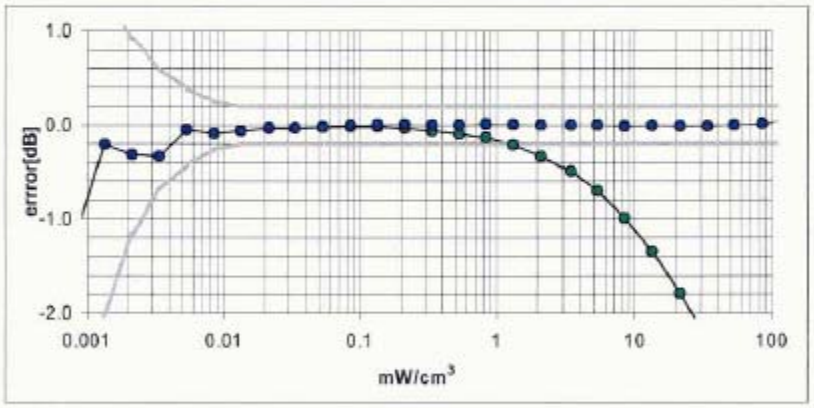


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

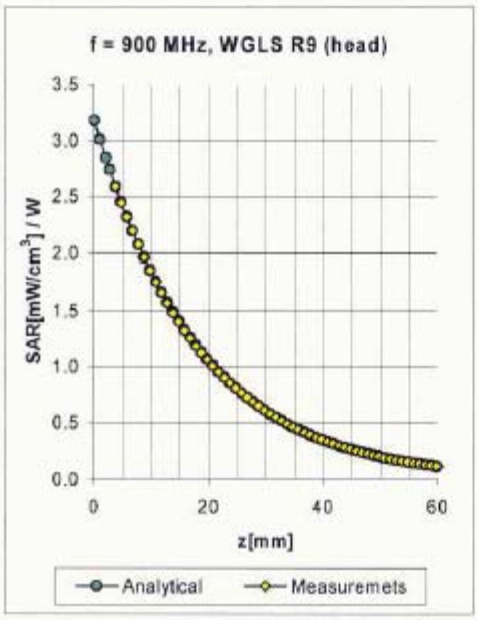
(Waveguide R22)

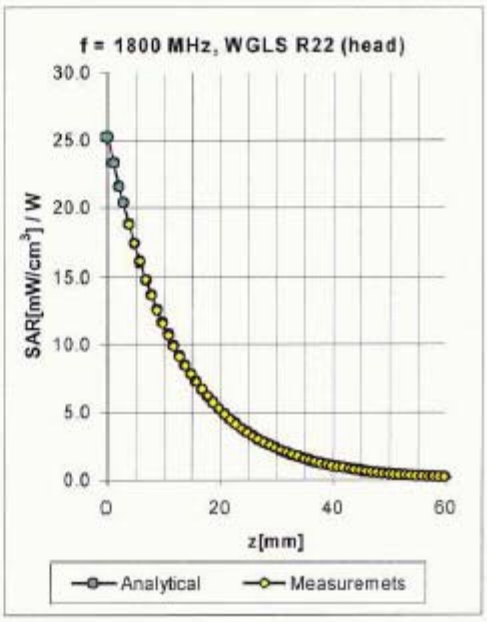




Probe Linearity Error < ± 0.2 dB

Conversion Factor Assessment





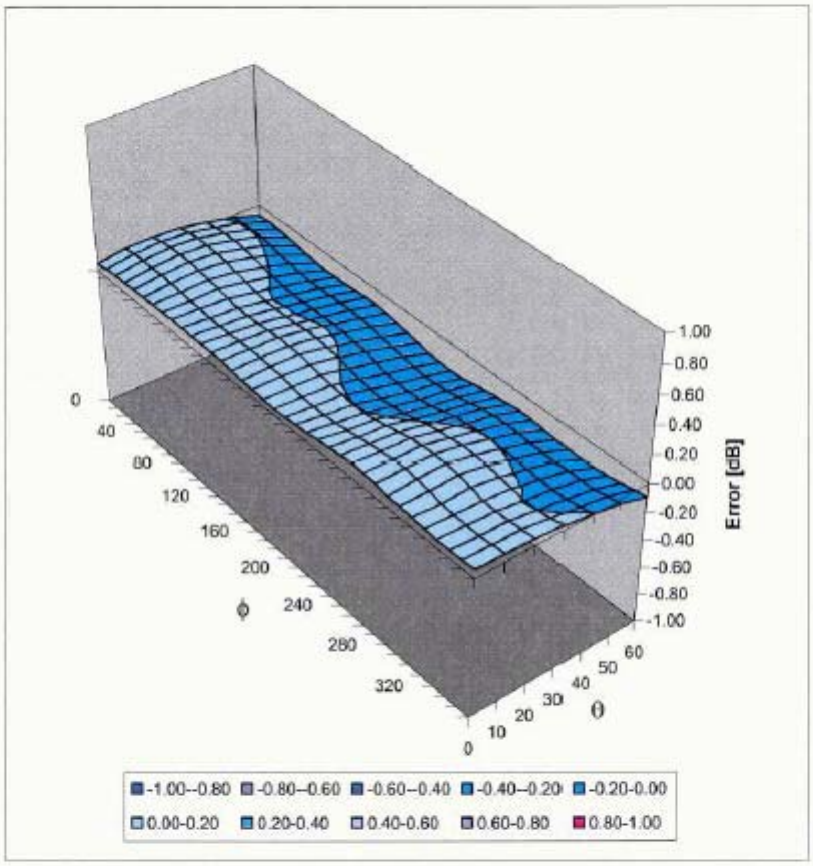
f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.79	1.71	6.53 ± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.58	2.42	5.32 ± 9.5% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	1.05	1.94	4.70 ± 9.5% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.61	2.06	6.09 ± 9.5% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.63	2.64	4.81 ± 9.5% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	1.81	1.29	4.64 ± 9.5% (k=2)

[B] The stated uncertainty of calibration in according to P1528.

ET3DV6 SN:1384 May 27, 2004

Deviation from Isotropy in HSL

Error (θ, φ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

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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

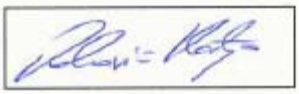
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1384**
Place of Assessment:	**Zurich**
Date of Assessment:	**May 27, 2004**
Probe Calibration Date:	**June 1, 2004**

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

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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

Dosimetric E-Field Probe ET3DV6 SN:1384

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.2 ± 8%**	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
250 MHz	ConvF	**8.0 ± 8%**	ε_r = 59.4 σ = 0.88 mho/m (body tissue)
300 MHz	ConvF	**7.8 ± 8%**	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
380 MHz	ConvF	**7.6 ± 8%**	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
480 MHz	ConvF	**7.4 ± 8%**	ε_r = 56.6 σ = 0.94 mho/m (body tissue)
800 MHz	ConvF	**6.5 ± 8%**	ε_r = 55.3 σ = 0.97 mho/m (body tissue)
1750 MHz	ConvF	**5.0 ± 8%**	ε_r = 53.3 σ = 1.52 mho/m (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also Section 4.7 of the DASY4 Manual.

Schmid & Partner Engineering AG

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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

Dosimetric E-Field Probe ET3DV6 SN:1384

Conversion factor (± standard deviation)

150 MHz	ConvF	**9.0 ± 8%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
250 MHz	ConvF	**7.9 ± 8%**	ε_r = 47.6 σ = 0.83 mho/m (head tissue)
300 MHz	ConvF	**7.8 ± 8%**	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
380 MHz	ConvF	**7.6 ± 8%**	ε_r = 44.3 σ = 0.87 mho/m (head tissue)
480 MHz	ConvF	**7.4 ± 8%**	ε_r = 43.3 σ = 0.87 mho/m (head tissue)
800 MHz	ConvF	**6.7 ± 8%**	ε_r = 41.7 σ = 0.90 mho/m (head tissue)
1750 MHz	ConvF	**5.4 ± 8%**	ε_r = 40.0 σ = 1.40 mho/m (head tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also Section 4.7 of the DASY4 Manual.

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

Client **Motorola CGISS**

CALIBRATION CERTIFICATE

Object(s)	D450V2 - SN:1002
Calibration procedure(s)	QA CAL-15.v2 Calibration procedure for dipole validation kits below 800 MHz
Calibration date:	March 13, 2004
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 (SPEAG, in house check Oct-03)	In house check: Oct 05
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 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Laboratory Director	
Approved by:	Fin Bomholt	R&D Director	

Date issued: March 13, 2004

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.

1. Measurement Conditions

The measurements were performed in the 6mm thick flat phantom filled with **head** simulating liquid of the following electrical parameters at 450 MHz:

Relative Dielectricity	**45.1**	± 5%
Conductivity	**0.85 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.45 at 450 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center 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 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 398 mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement with DASY 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:	**5.33 mW/g** ± 20.7 % (k=2)[1]
averaged over 10 cm^3 (10 g) of tissue:	**3.55 mW/g** ± 20.2 % (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:	**1.351 ns**	(one direction)
Transmission factor:	**0.993**	(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 450 MHz:	Re{Z} = **54.0 Ω**
	Im {Z} = **-8.5 Ω**
Return Loss at 450 MHz	**-21.1 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.

Date/Time: 03/13/04 14:31:46

Test Laboratory: SPEAG, Zurich, Switzerland
DUT: Dipole 450 MHz; Serial: D450V2 - SN:1002

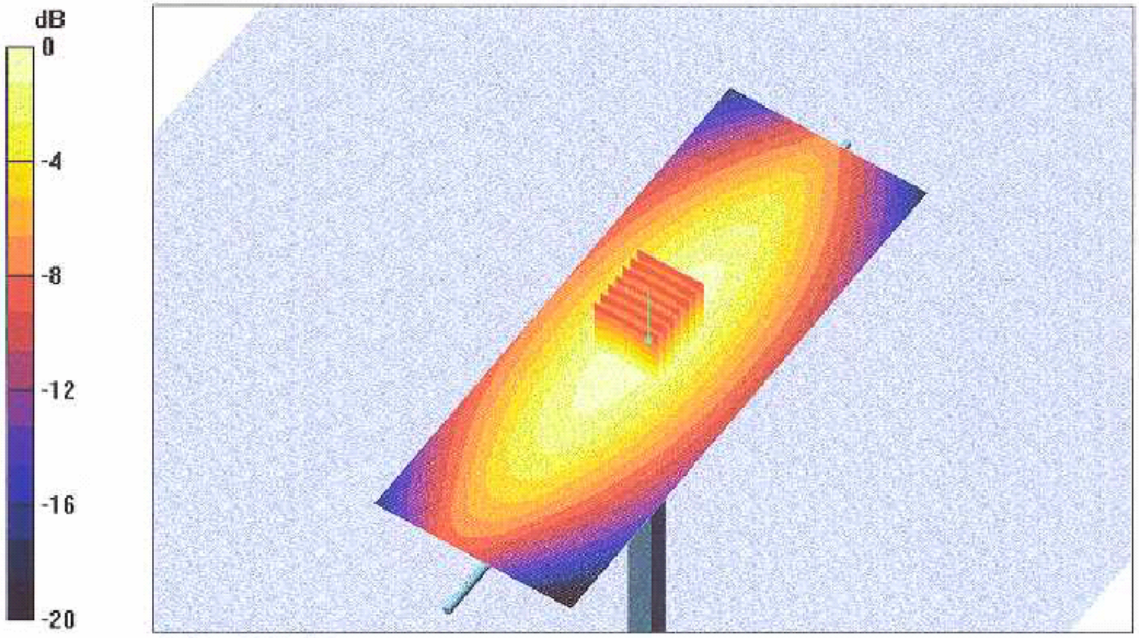
Communication System: CW;Duty Cycle: 1:1;Medium: HSL450
Medium parameters used: f = 450 MHz; σ = 0.85 mho/m; ε_r = 45.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.45, 6.45, 6.45); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 600; Calibrated: 9/30/2003
- Phantom: Flat Phantom 4.4; Phantom section: Flat Section
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

d=15mm, Pin=398mW/Area Scan (61x161x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 53 V/m; Power Drift = -0.0 dB
Maximum value of SAR (interpolated) = 2.25 mW/g

d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53 V/m; Power Drift = -0.0 dB
Maximum value of SAR (measured) = 2.28 mW/g
Peak SAR (extrapolated) = 3.24 W/kg
SAR(1 g) = 2.12 mW/g; SAR(10 g) = 1.41 mW/g



0 dB = 2.28mW/g

Date/Time: 03/13/04 14:31:46

Test Laboratory: SPEAG, Zurich, Switzerland
DUT: Dipole 450 MHz; Serial: D450V2 - SN:1002

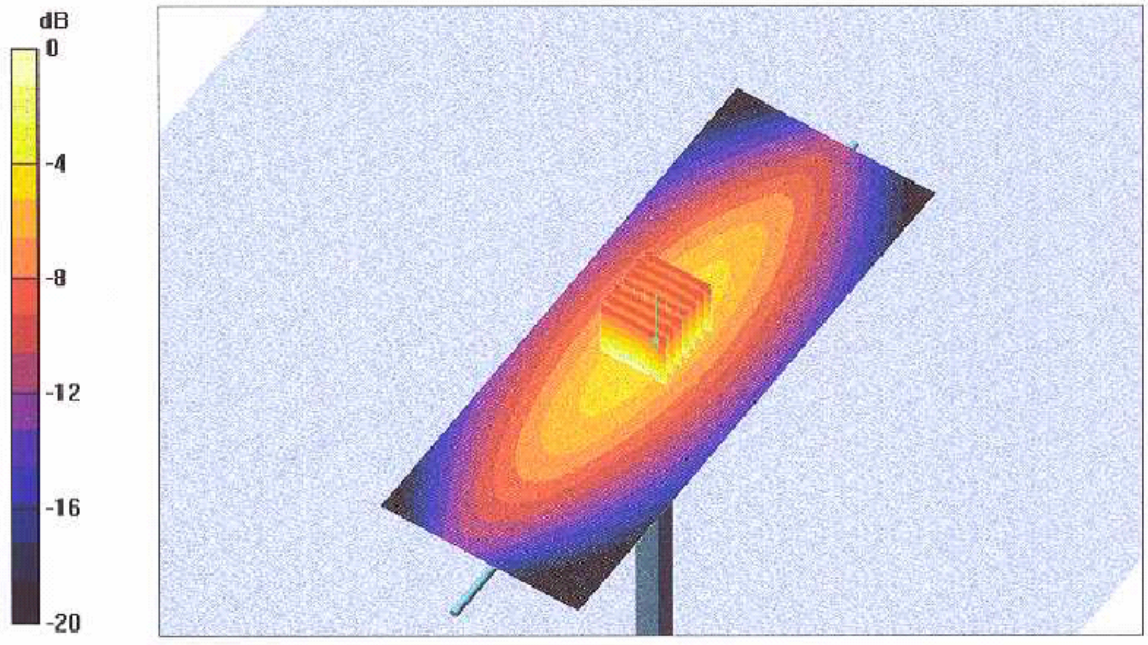
Communication System: CW;Duty Cycle: 1:1;Medium: HSL450
Medium parameters used: f = 450 MHz; σ = 0.85 mho/m; ε_r = 45.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.45, 6.45, 6.45); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 600; Calibrated: 9/30/2003
- Phantom: Flat Phantom 4.4; Phantom section: Flat Section
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

d=15mm, Pin=398mW/Area Scan (61x161x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 53 V/m; Power Drift = -0.0 dB
Maximum value of SAR (interpolated) = 2.25 mW/g

d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53 V/m; Power Drift = -0.0 dB
Maximum value of SAR (measured) = 5.72 mW/g
Peak SAR (extrapolated) = 8.13 W/kg
SAR(1 g) = 5.33 mW/g; SAR(10 g) = 3.55 mW/g
Normalized to target power = 1 W and actual power = 0.398 W



0 dB = 5.72mW/g

APPENDIX E

Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT4865. 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 NNTN4115A
Back view

Photo 2
Model NNTN4115A
Front view

Photo 3
Model NNTN4115A
Side view

Photo 4
Model NNTN4116A
Back view

Photo 5
Model NNTN4116A
Front view

Photo 6
Model NNTN4116A
Side view

Photo 7
Model NNTN4117A
Back view

Photo 8
Model NNTN4117A
Front view

Photo 9
Model NNTN4117A
Side view

Photo 10
Model HLN6853A
Back view

Photo 11
Model HLN6853A
Side view

Photo 12
Model HLN9844A
Back view

Photo 13
Model HLN9844A
Side 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 body-worn accessories:

Carry Case Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
NNTN4115A	yes	64-80	NA
NNTN4116A	yes	70-86	NA
NNTN4117A	yes	75-90	NA
HLN9844A	yes	31-44	NA
HLN6853A	yes	33-41	NA
TDN9675A	No	NA	Wrist Strap for carrying radio. Not intended to use with audio accessories
NLN6349A	No	NA	Shoulder Strap for carrying radio. Not intended to use with the audio accessories
NTN5243A	No	NA	Shoulder Strap for carrying radio. Not intended to use with the audio accessories

Audio Acc. Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
BDN6665A	Yes	NA	receive only
BDN6666A	Yes	NA	receive only
BDN6781A	Yes	NA	receive only
NMN6191C	Yes	NA	NA
BDN6641A	Yes	NA	Part of model BDN6671B and tested w/0180300E83
BDN6671B	Yes	NA	tested w/BDN6641A & 0180300E83
BDN6645A	Yes	NA	tested w/BDN6673B
BDN6673B	Yes	NA	tested w/BDN6645A
BDN6729A	Yes	NA	tested w/BDN6676D
BDN6730A	Yes	NA	tested w/BDN6676D
BDN6676D	Yes	NA	Used with various accessories
NMN1020A	Yes	NA	NA
NMN6245A	Yes	NA	tested w/BDN6676D
NMN6246B	Yes	NA	tested w/BDN6676D
NMN6258A	Yes	NA	tested w/BDN6676D

RMN4049A	Yes	NA	NA
ZMN6031A	Yes	NA	tested w/NTN8613A
ZMN6032A	Yes	NA	tested w/NTN8613A
NTN1625A	Yes	NA	NA
0180300E83	Yes	NA	tested w/BDN6671B & BDN6641A
NTN8613A	Yes	NA	Tested w/ ZMN6031A & ZMN6032A
BDN6664A	No	NA	Similar to BDN6665A
BDN6667A	No	NA	Similar to BDN6729A
BDN6668A	No	NA	Similar to BDN6730A
BDN6669A	No	NA	Similar to BDN6729A
BDN6670A	No	NA	Similar to BDN6730A
BDN6719A	No	NA	Similar to BDN6665A
BDN6780A	No	NA	Similar to BDN6729A
NMN6193C	No	NA	Similar to NMN6191C
BDN6677A	No	NA	Similar to BDN6641A
BDN6678A	No	NA	Similar to BDN6641A
BDN6708B	No	NA	Similar to BDN6671B
BDN6726A	No	NA	Similar to BDN6665A
BDN6727A	No	NA	Similar to BDN6665A
BDN6728A	No	NA	Similar to BDN6666A
BDN6731A	No	NA	Similar to BDN6729A
BDN6732A	No	NA	Similar to BDN6730A
BDN6635C	No	NA	Similar to BDN6645A
BDN6636C	No	NA	Similar to BDN6645A
NMN6259A	No	NA	Similar to NMN6258A
NNTN4285A	No	NA	RSM adaptor
ZMN6038A	No	NA	Similar to ZMN6032A
ZMN6039A	No	NA	Similar to ZMN6031A
NTN1624A	No	NA	Similar to NTN1625A
NTN1663A	No	NA	Similar to NTN1625A
NTN1736A	No	NA	Similar to NTN1625A
NTN7660C	No	NA	Tilt man down switch