Certificate Number: 1449-02

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:	February 05, 2004
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	1:6, 1:3, 81:120, 1:12 TDMA; 64 QAM, 16 QAM & QPSK Modulation; 0.6 W Pulse average
FCC ID:	**AZ489FT5828**
Device Model:	H74XAH6RR4AN/NUF3783A

Test Period:	1/21/04 - 2/3/04
EME Tech:	Ed Church
EME Eng.:	Stephen Whalen (Sr. EME 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.

Deanna Zakharia signature on file for Ken Enger — 2/5/04

Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab

Date Approved

APPENDIX A

Power Slump Data/Shortened Scan

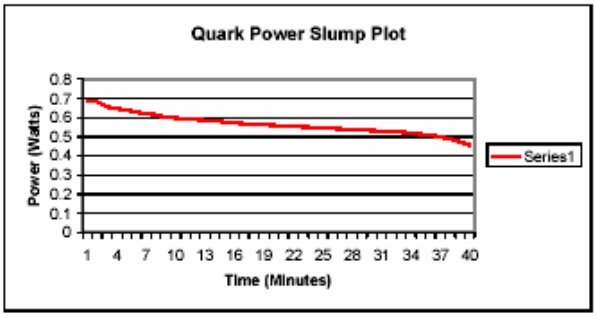
DUT Power versus time data

i830 Quark Power Slump

Start Date and Time:2/4/2004 11:21:01 AM
Stop Date and Time: 2/4/2004 12:02:07 PM

Radio SN 364ADY0J12
Data mode (81:120)
Frequency 813.5125MHz
Battery NNTN4930A

	Time (Minutes)	Power (W)
11:22:05 AM	0	0.681
11:23:05 AM	1	0.681
11:24:05 AM	2	0.656
11:25:05 AM	3	0.646
11:26:05 AM	4	0.639
11:27:05 AM	5	0.627
11:28:06 AM	6	0.618
11:29:06 AM	7	0.613
11:30:06 AM	8	0.599
11:31:06 AM	9	0.597
11:32:06 AM	10	0.593
11:33:06 AM	11	0.59
11:34:06 AM	12	0.586
11:35:06 AM	13	0.585
11:36:06 AM	14	0.576
11:37:06 AM	15	0.573
11:38:06 AM	16	0.566
11:39:06 AM	17	0.567
11:40:06 AM	18	0.561
11:41:06 AM	19	0.559
11:42:06 AM	20	0.555
11:43:06 AM	21	0.553
11:44:06 AM	22	0.55
11:45:06 AM	23	0.548
11:46:06 AM	24	0.545
11:47:06 AM	25	0.542
11:48:07 AM	26	0.541
11:49:07 AM	27	0.539
11:50:07 AM	28	0.535
11:51:07 AM	29	0.532
11:52:07 AM	30	0.528
11:53:07 AM	31	0.525
11:54:07 AM	32	0.522
11:55:07 AM	33	0.519
11:56:07 AM	34	0.512
11:57:07 AM	35	0.506
11:58:07 AM	36	0.498
11:59:07 AM	37	0.487
12:00:07 PM	38	0.473
12:01:07 PM	39	0.456



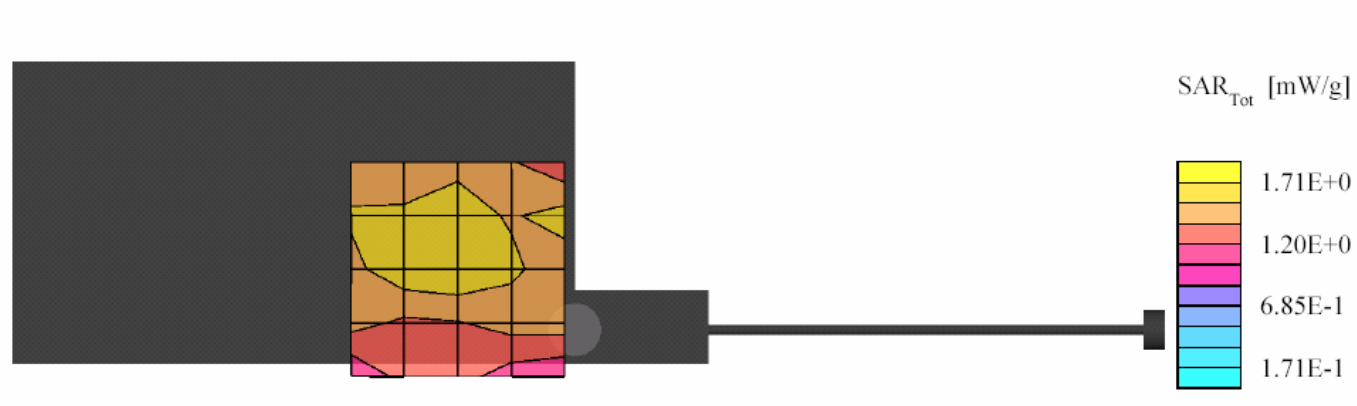
Shortened Scan Results

FCC ID: AZ489FT5828; Test Date: 2/2/04
Motorola CGISS EME Laboratory
Run #: Ab-R3-040202-02
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 813.5125 MHz
Sim Tissue Temp: 21.6 (Celsius)
Start Power: 0.664 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NNTN5002A
Audio/Data Acc.: None

Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.
Representative "normal" scan run time was 23 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.448 mW/g; 10-g Avg. = 1.048mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.448 mW/g; 10-g Avg. = 1.049mW/g
(see section 7.1 run # ec-ab-r3-040129-09)

DUT with holster against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Probe cal date: 16/04/03; Crest factor: 1.5;
FCC Body 813: σ = 0.93 mho/m ε = 53.6 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 5x5x7: SAR (1g): 1.24 mW/g, SAR (10g): 0.897 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 1.24 mW/g, SAR (10g): 0.897 mW/g
Power Drift: -0.49 dB

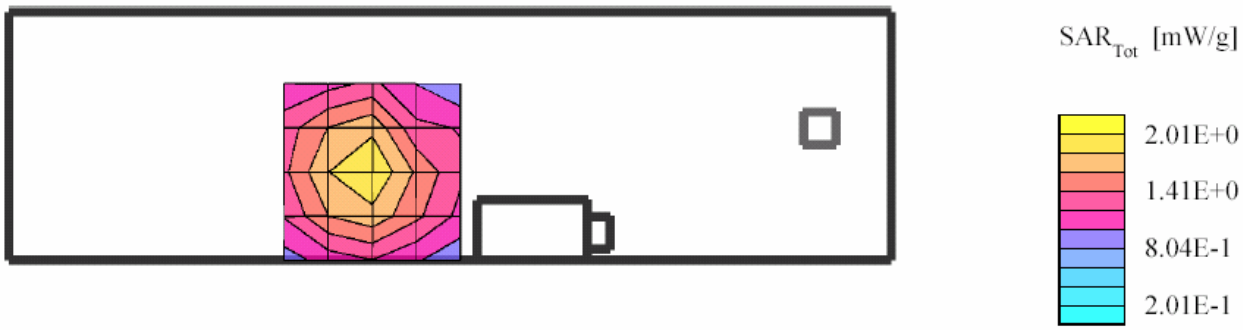


FCC ID: AZ489FT5828; Test Date: 2/03/04
Motorola CGISS EME Laboratory
Run #: REAR-R3-040203-02
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 806.0125 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power: 0.681 W

Antenna: Retracted
Battery Kit: NNTN4930A
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 27 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.351 mW/g; 10-g Avg. = 0.870 mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.407 mW/g; 10-g Avg. = 0.911 mW/g
(see section 7.1 run # sw-rear-r3-040127-04)

DUT at the right ear in cheek touch position
SAM Phantom; Righ Hand Section; Position: (90°,301°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 3.0;
IEEE Head 813 MHz: σ = 0.92 mho/m ε = 41.9 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 5x5x7: SAR (1g): 1.29 mW/g, SAR (10g): 0.831 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 1.29 mW/g, SAR (10g): 0.831 mW/g
Power Drift: -0.08dB

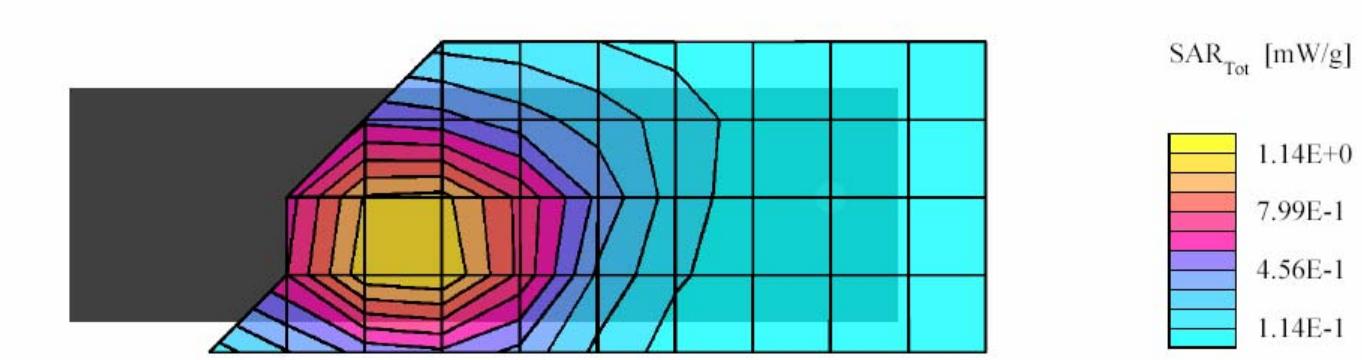


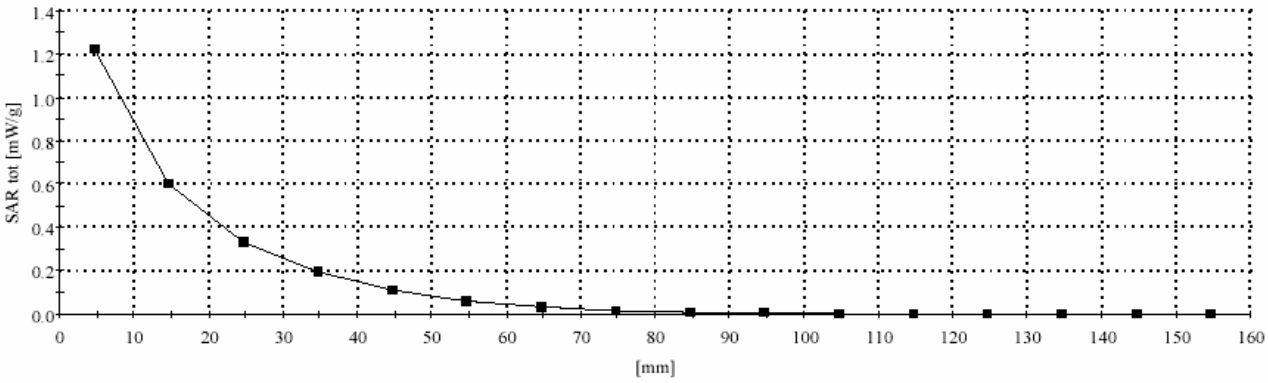
APPENDIX B
Data Results

FCC ID: AZ489FT5828; Test Date: 1/27/04
Motorola CGISS EME Laboratory
Run #: REAR-R3-040127-04
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 806.0125 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power: 0.715 W

Antenna: Retracted
Battery Kit: NNTN4930A
Carry Case: NONE
Audio/Data Acc.: NONE

DUT at right ear in cheek touch position
SAM Phantom; Position: (90°,301°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 3.0;
IEEE Head 813 MHz: σ = 0.93 mho/m ε = 42.1 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 1.24 mW/g, SAR (10g): 0.803 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 39.0, 21.0, 4.7
Power Drift: -0.55 dB

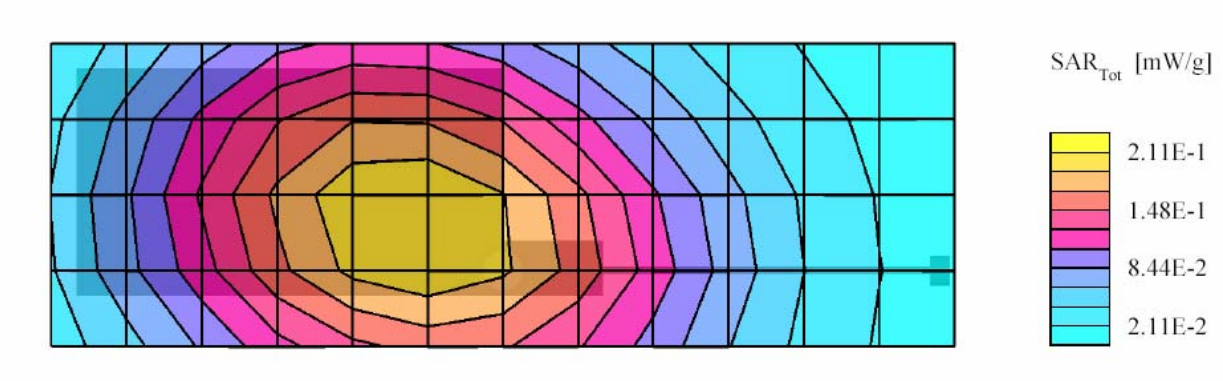


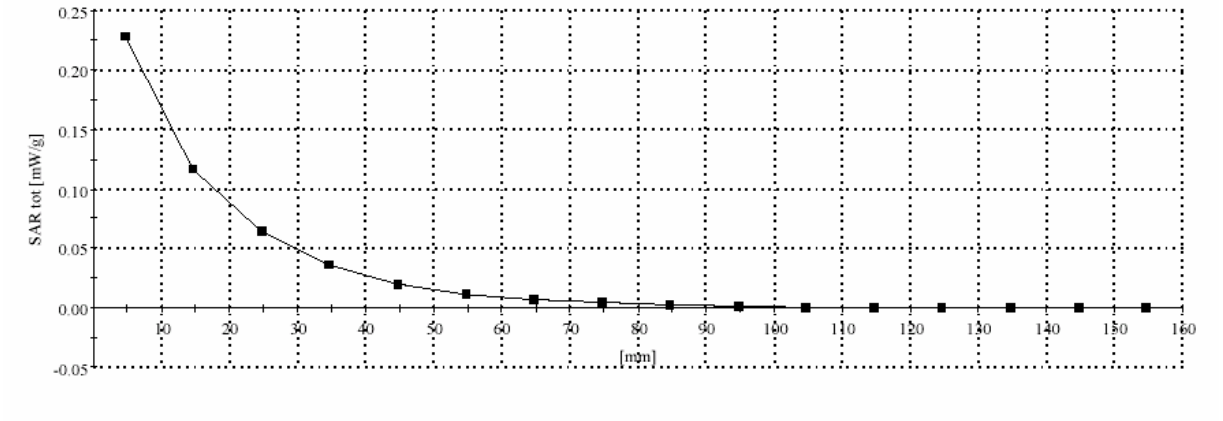


FCC ID: AZ489FT5828; Test Date: 1/27/04
Motorola CGISS EME Laboratory
Run #: FACE-R3-040127-17
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 806.0125 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power: 0.678 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NONE
Audio/Data Acc.: NONE

DUT front towards phantom with 2.5 cm separation; Flip closed
SAM Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 6.0;
IEEE Head 813 MHz: σ = 0.93 mho/m ε = 42.1 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 0.215 mW/g, SAR (10g): 0.156 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 36.0, 72.0, 4.7
Power Drift: 0.05 dB

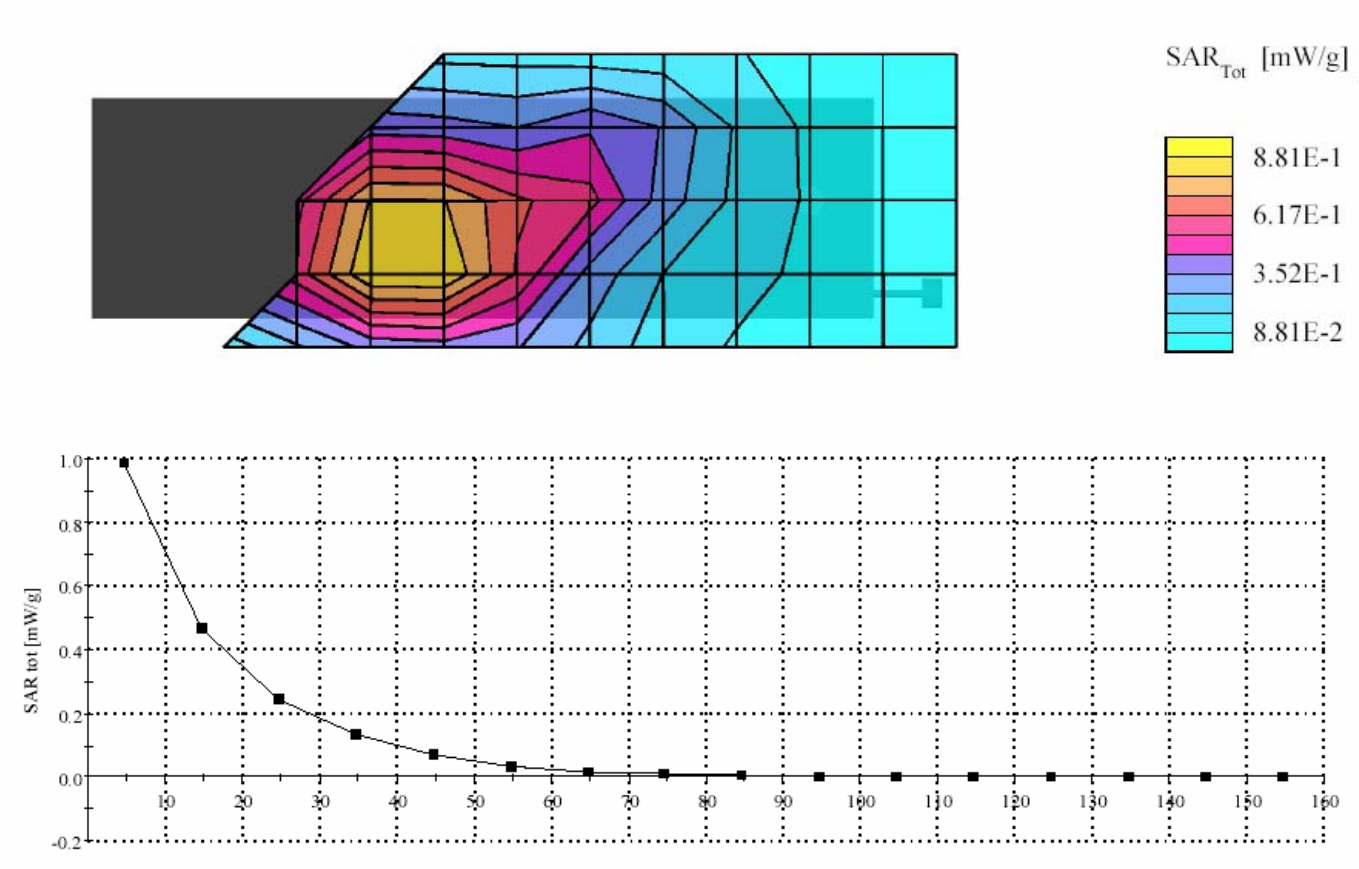




FCC ID: AZ489FT5828; Test Date: 1/27/04
Motorola CGISS EME Laboratory
Run #: REAR-R3-040127-10
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 901.98125 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power: 0.708 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NONE
Audio/Data Acc.: NONE

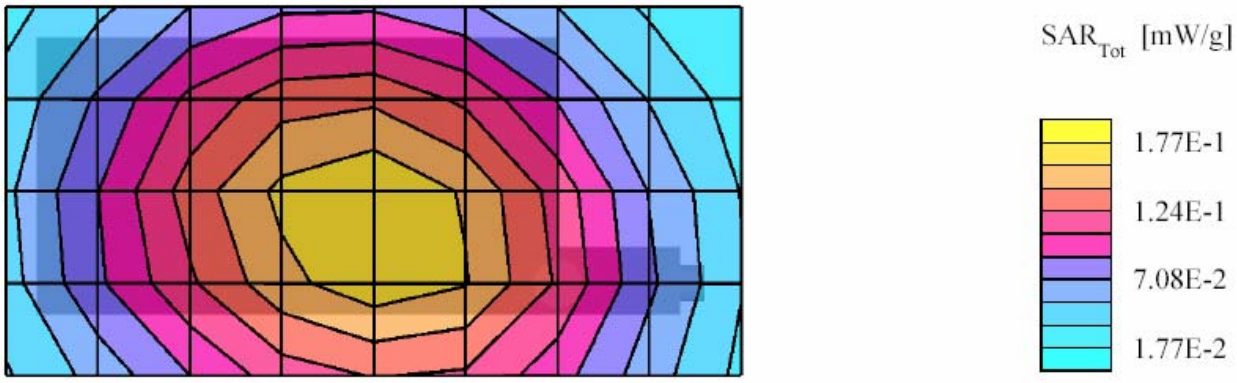
DUT at right ear in Cheek Touch position
SAM Phantom; Position: (90°,301°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 3.0;
IEEE Head 899 MHz: σ = 1.01 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 0.989 mW/g, SAR (10g): 0.637 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 37.5, 19.5, 4.7
Power drift: -0.11dB

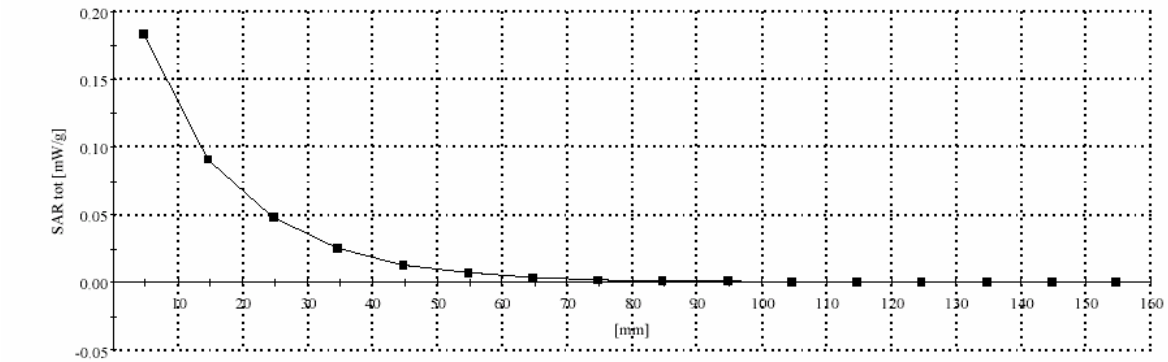


FCC ID: AZ489FT5828; Test Date: 1/28/04
Motorola CGISS EME Laboratory
Run #: FACE-R3-040128-08
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 896.01875 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power: 0.689 W

Antenna: Retracted
Battery Kit: NNTN5195A
Carry Case: NONE
Audio/Data Acc.: NONE

DUT front towards phantom with 2.5 cm separation distance; Flip closed
SAM Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 6.0;
IEEE Head 899 MHz: σ = 1.01 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 0.178 mW/g, SAR (10g): 0.125 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 36.0, 60.0, 4.7
Power Drift: -0.09 dB

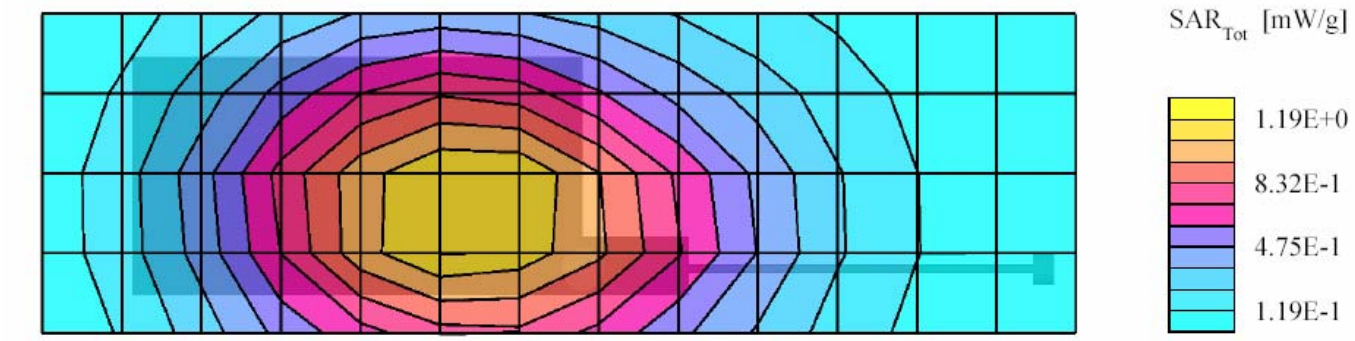


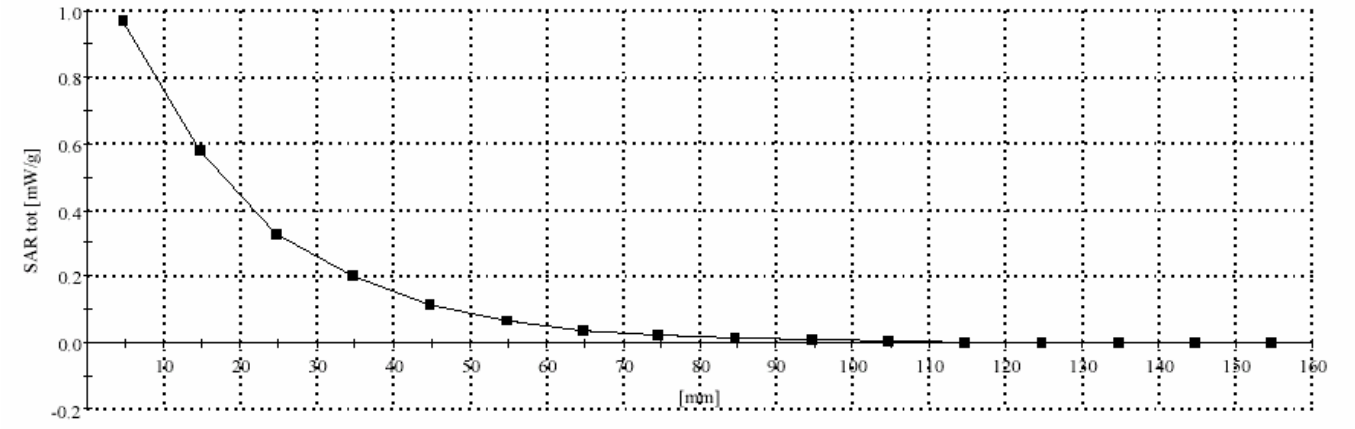


FCC ID: AZ489FT5828; Test Date: 1/29/04
Motorola CGISS EME Laboratory
Run #: Ab-R3-040129-09
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 813.5125 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power: 0.662 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NNTN5002A
Audio/Data Acc.: None

DUT with holster against the phantom
Flat Phantom; Position: (90°,90°)
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Probe cal date: 16/04/03; Crest factor: 1.5;
FCC Body 813: σ = 0.93 mho/m ε = 53.8 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 1.09 mW/g, SAR (10g): 0.790 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 37.5, 81.0, 4.7
Power Drift: -0.99 dB

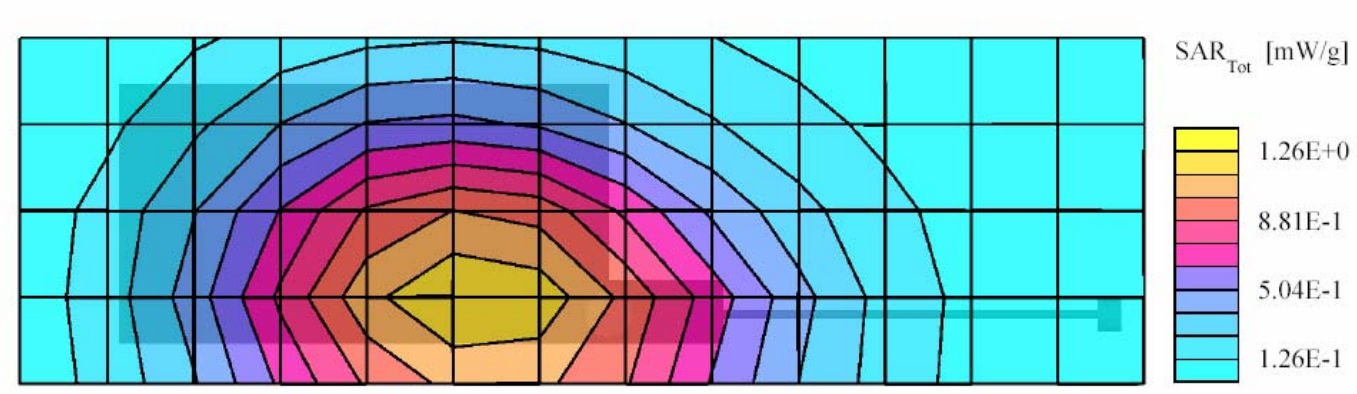


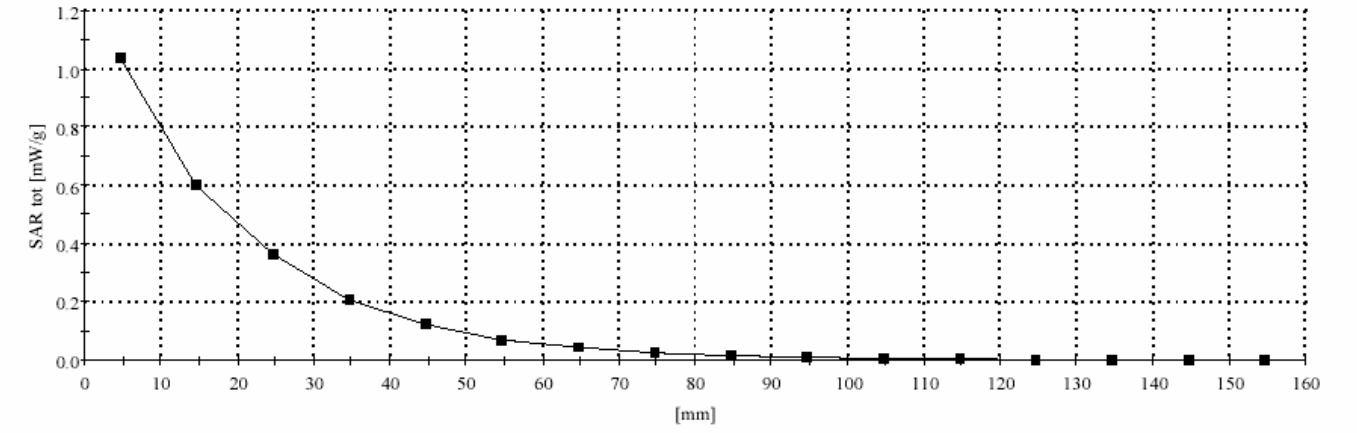


FCC ID: AZ489FT5828; Test Date: 1/30/04
Motorola CGISS EME Laboratory
Run #: Ab-R3-040130-16
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 806.0125 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power: 0.691 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NNTN5002A
Audio/Data Acc.: None

DUT with holster against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Probe cal date: 16/04/03; Crest factor: 1.5;
FCC Body 813: σ = 0.93 mho/m ε = 53.8 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 1.09 mW/g, SAR (10g): 0.796 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 46.5, 79.5, 4.7
Power drift: -1.02 dB

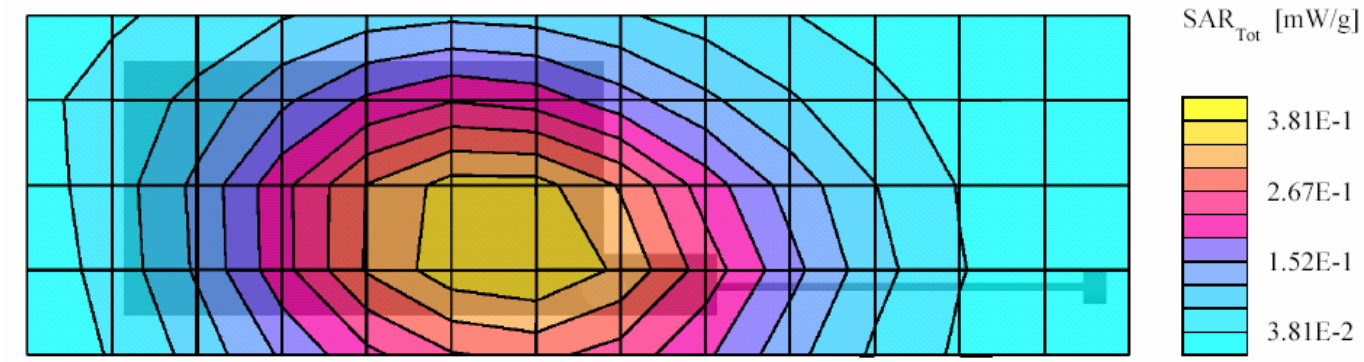


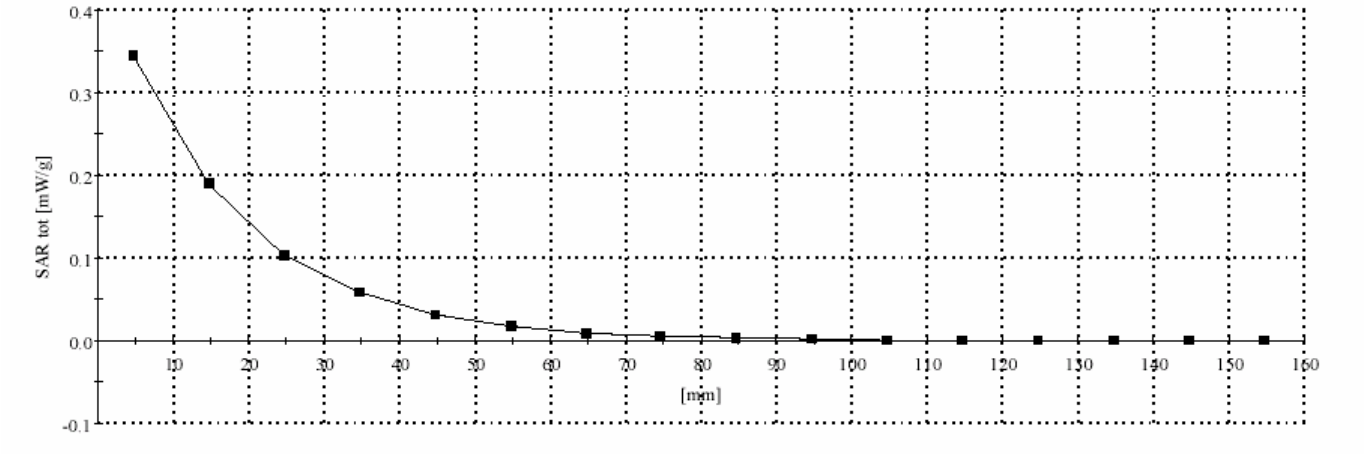


FCC ID: AZ489FT5828; Test Date: 1/31/04
Motorola CGISS EME Laboratory
Run #: Ab-R3-040131-06
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 901.98125 MHz
Sim Tissue Temp: 21.5 (Celsius)
Start Power: 0.665 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: NNTN5002A
Audio/Data Acc.: NNTN5006A

DUT with holster against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Probe cal date: 16/04/03; Crest factor: 3.0;
FCC Body 899 MHz: σ = 1.02 mho/m ε = 52.7 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 0.375 mW/g, SAR (10g): 0.266 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 39.0, 85.5, 4.7
Power Drift: -0.35 dB



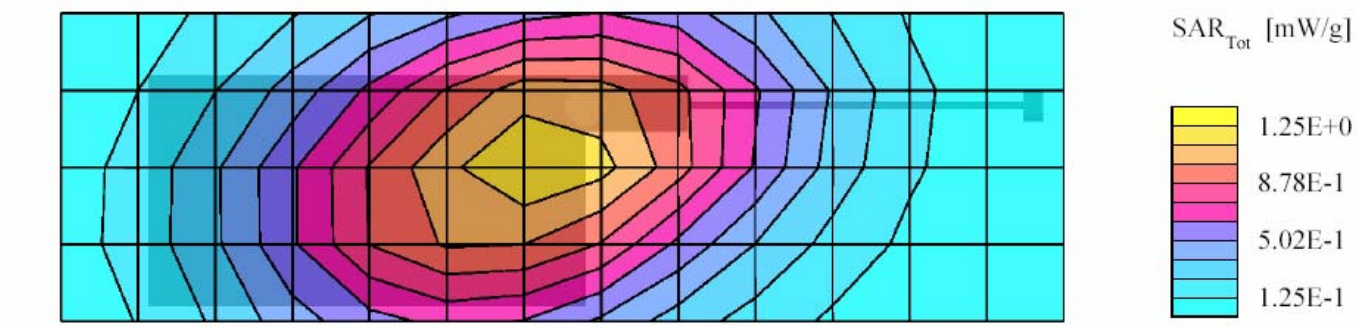


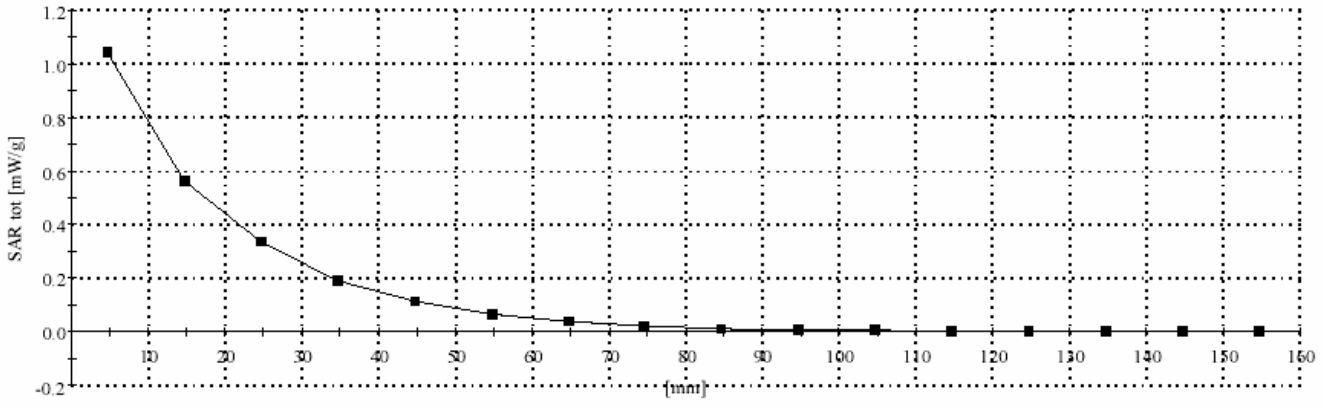
FCC ID: AZ489FT5828; Test Date: 1/31/04
Motorola CGISS EME Laboratory

Run #: Ab-R3-040131-10
Model #: H74XAH6RR4AN / NUF3783A SN: 364ADY0J12
TX Freq: 813.5125 MHz
Sim Tissue Temp: 21.5 (Celsius)
Start Power: 0.685 W

Antenna: Extended
Battery Kit: NNTN4930A
Carry Case: None
Audio/Data Acc.: None

DUT back towards phantom with 2.5cm separation
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Probe cal date: 16/04/03; Crest factor: 1.5;
FCC Body 813: σ = 0.93 mho/m ε = 53.5 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cube 7x7x7: SAR (1g): 1.11 mW/g, SAR (10g): 0.803 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 28.5, 93.0, 4.7
Power drift: -0.87 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.





APPENDIX C

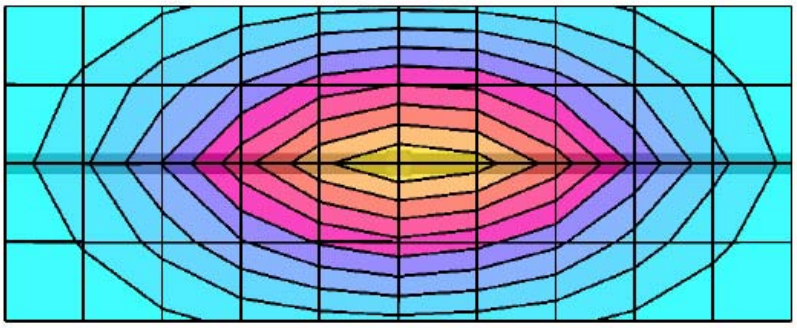
Dipole System Performance Check Results

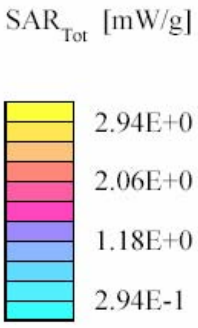
Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The CGISS EME lab validated the dipole to the applicable IEEE system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for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

SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/21/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040121-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.5 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.69 mW/g (1g avg). Percent from target (including drift) is -2.58 %
SAR calculated at 1W is 7.32 mW/g (10g avg). Percent from target (including drift) is -2.65 %

SAM Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Probe cal date: 16/04/03; Crest factor: 1.0;
IEEE Head 900 MHz: σ = 1.01 mho/m ε = 40.8 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): SAR (1g): 2.97 mW/g ± 0.04 dB, SAR (10g): 1.86 mW/g ± 0.04 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 30.0, 78.0, 4.7
Power drift: 0.07 dB

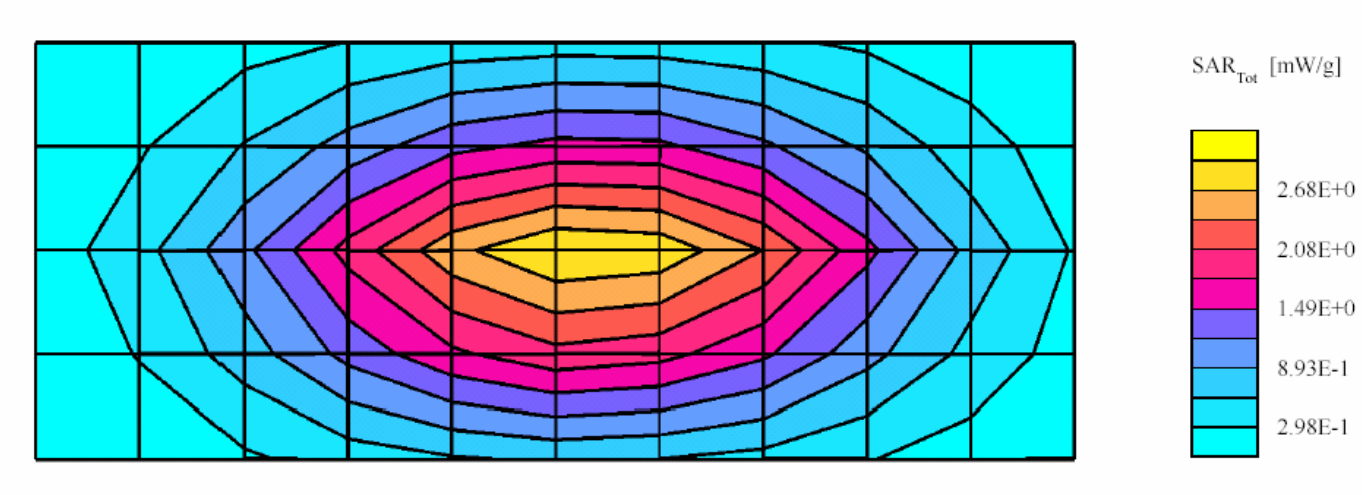




SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/22/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040122-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 12.00 mW/g (1g avg). Percent from target (including drift) is 0.04 %
SAR calculated at 1W is 7.52 mW/g (10g avg). Percent from target (including drift) is -0.03 %

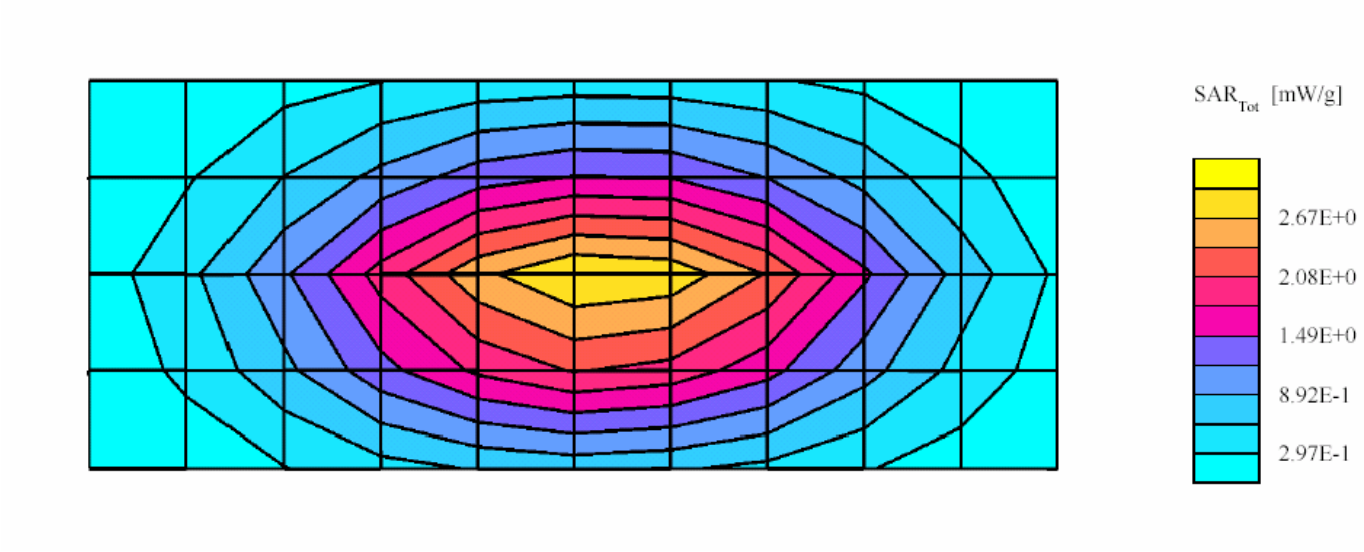
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.86 mW/g ± 0.03 dB, SAR (1g): 3.05 mW/g ± 0.04 dB, SAR (10g): 1.91 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.5, 12.2) [mm]
Power drift: 0.07 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/23/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040123-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 12.13 mW/g (1g avg). Percent from target (including drift) is 1.06 %
SAR calculated at 1W is 7.57 mW/g (10g avg). Percent from target (including drift) is 0.66 %

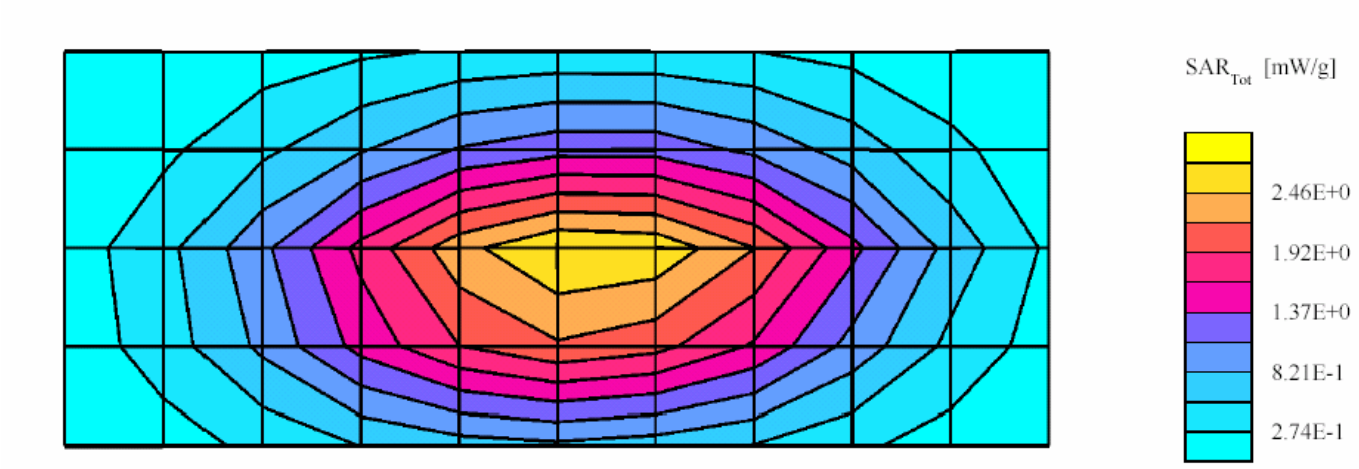
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 40.8 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.89 mW/g ± 0.03 dB, SAR (1g): 3.06 mW/g ± 0.04 dB, SAR (10g): 1.91 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.5, 12.3) [mm]
Power drift: 0.04 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/26/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040126-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.7 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.64 mW/g (1g avg). Percent from target (including drift) is -3.00 %
SAR calculated at 1W is 7.28 mW/g (10g avg). Percent from target (including drift) is -3.19 %

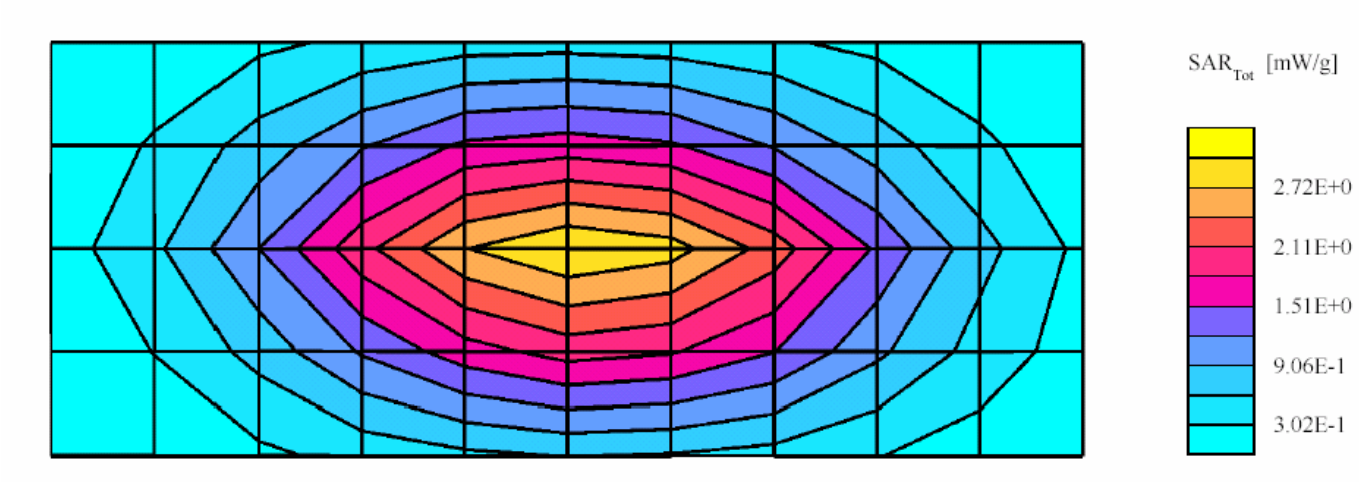
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.00 mho/m ε = 40.5 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.64 mW/g ± 0.01 dB, SAR (1g): 2.91 mW/g ± 0.03 dB, SAR (10g): 1.82 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.4, 12.3) [mm]
Power drift: -0.00 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/27/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040127-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 12.37 mW/g (1g avg). Percent from target (including drift) is 3.09 %
SAR calculated at 1W is 7.74 mW/g (10g avg). Percent from target (including drift) is 2.96 %

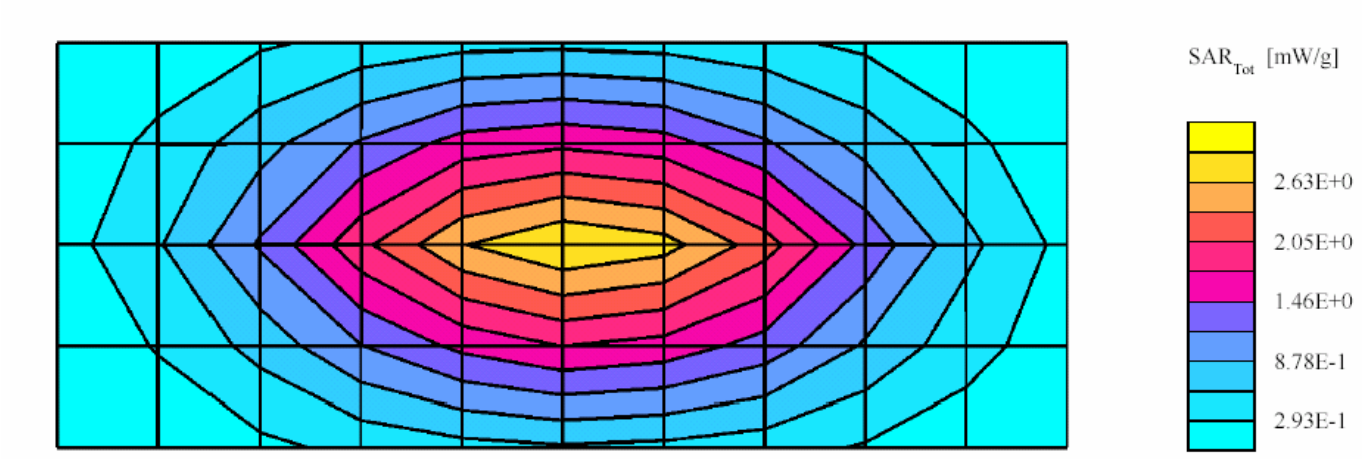
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.68 mW/g ± 0.02 dB, SAR (1g): 2.94 mW/g ± 0.01 dB, SAR (10g): 1.84 mW/g ± 0.00 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.5, 12.2) [mm]
Power drift: -0.22 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/28/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040128-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.56 mW/g (1g avg). Percent from target (including drift) is -3.67 %
SAR calculated at 1W is 7.26 mW/g (10g avg). Percent from target (including drift) is -3.47 %

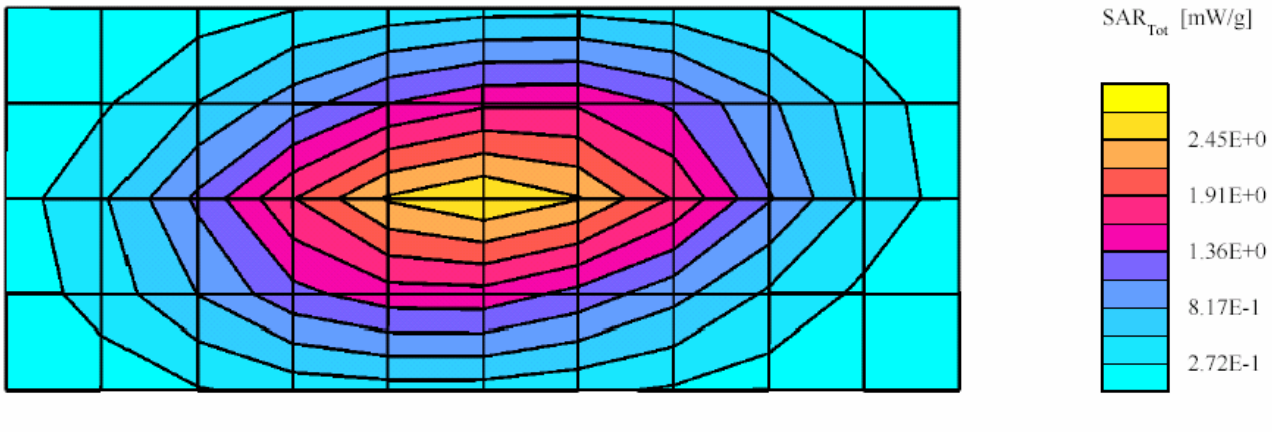
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.68 mW/g ± 0.00 dB, SAR (1g): 2.93 mW/g ± 0.02 dB, SAR (10g): 1.84 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.4, 12.2) [mm]
Power drift: 0.06 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/28/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040128-14
TX Freq: 900 MHz
Sim Tissue Temp: 20.8 (Celsius)
Start Power; 250mW

SAR target at 1W is 11.17 mW/g (1g avg, including drift)
SAR target at 1W is 7.11 mW/g (10g avg, including drift)
SAR calculated at 1W is 10.82 mW/g (1g avg). Percent from target (including drift) is -3.18 %
SAR calculated at 1W is 6.90 mW/g (10g avg). Percent from target (including drift) is -2.90 %

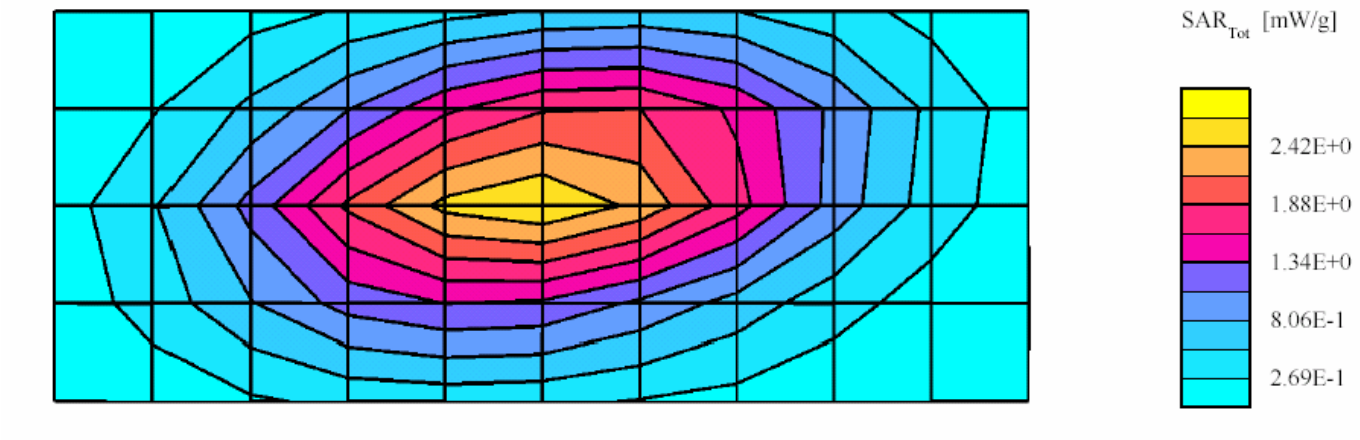
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ = 1.03 mho/m ε = 52.9 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.19 mW/g ± 0.03 dB, SAR (1g): 2.71 mW/g ± 0.04 dB, SAR (10g): 1.73 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.2 (11.3, 13.3) [mm]
Power drift: 0.01 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/29/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040129-02
TX Freq: 900 MHz
Sim Tissue Temp: 21.5 (Celsius)
Start Power; 250mW

SAR target at 1W is 11.17 mW/g (1g avg, including drift)
SAR target at 1W is 7.11 mW/g (10g avg, including drift)
SAR calculated at 1W is 10.89 mW/g (1g avg). Percent from target (including drift) is -2.51 %
SAR calculated at 1W is 6.95 mW/g (10g avg). Percent from target (including drift) is -2.22 %

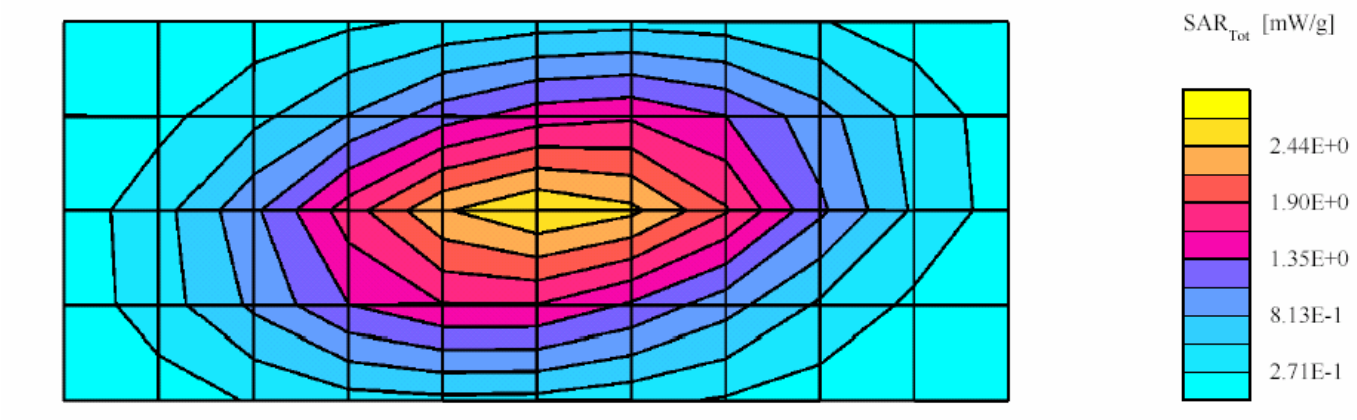
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ =1.02 mho/m ε = 53.0 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.21 mW/g ± 0.04 dB, SAR (1g): 2.71 mW/g ± 0.05 dB, SAR (10g): 1.73 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.2 (11.3, 13.4) [mm]
Power drift: -0.02 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/30/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040130-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.6 (Celsius)
Start Power; 250mW

SAR target at 1W is 11.17 mW/g (1g avg, including drift)
SAR target at 1W is 7.11 mW/g (10g avg, including drift)
SAR calculated at 1W is 10.77 mW/g (1g avg). Percent from target (including drift) is -3.59 %
SAR calculated at 1W is 6.87 mW/g (10g avg). Percent from target (including drift) is -3.35 %

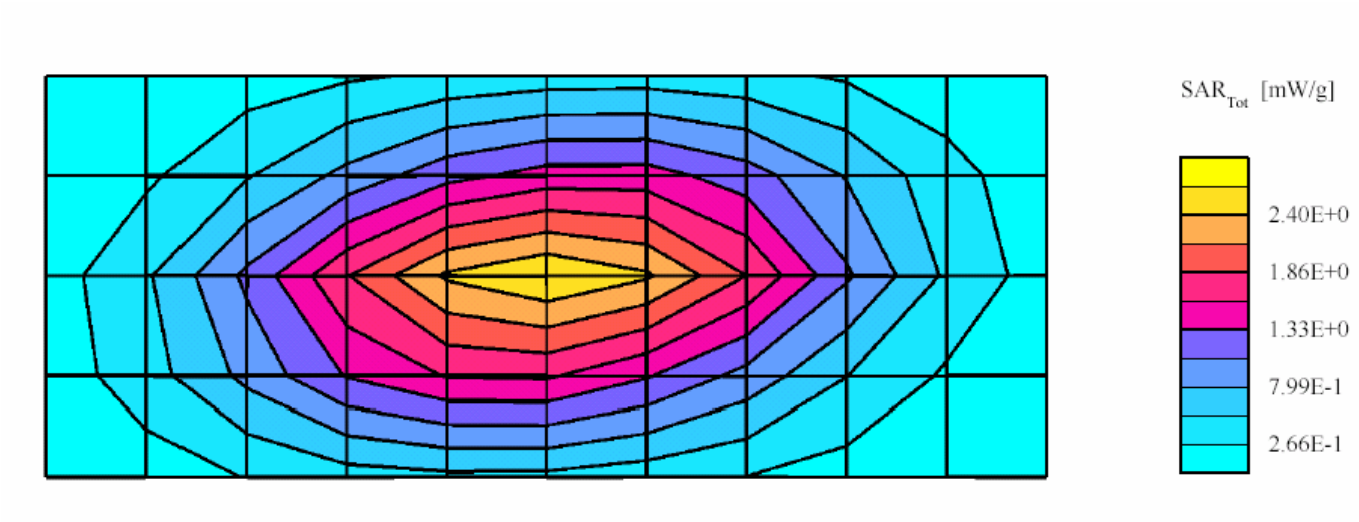
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ = 1.02 mho/m ε = 52.9 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.17 mW/g ± 0.06 dB, SAR (1g): 2.68 mW/g ± 0.06 dB, SAR (10g): 1.71 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.2 (11.3, 13.3) [mm]
Power drift: -0.02 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 1/31/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040131-01
TX Freq: 900 MHz Sim
Tissue Temp: 21.5 (Celsius)
Start Power; 250mW

SAR target at 1W is 11.17 mW/g (1g avg, including drift)
SAR target at 1W is 7.11 mW/g (10g avg, including drift)
SAR calculated at 1W is 10.60 mW/g (1g avg). Percent from target (including drift) is -5.10 %
SAR calculated at 1W is 6.80 mW/g (10g avg). Percent from target (including drift) is -4.36 %

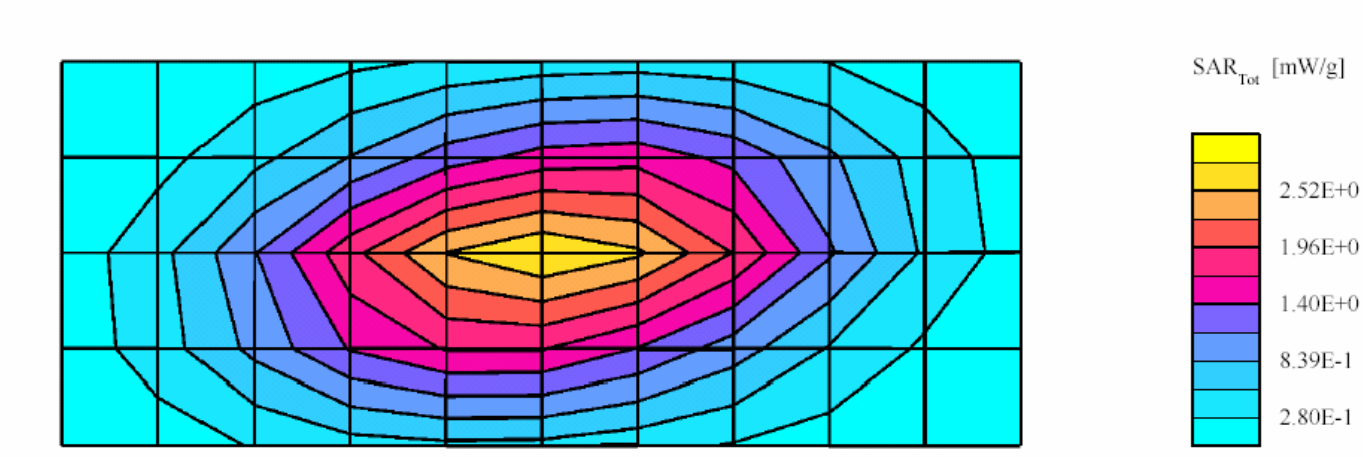
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ = 1.02 mho/m ε = 52.7 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.12 mW/g ± 0.03 dB, SAR (1g): 2.65 mW/g ± 0.05 dB, SAR (10g): 1.70 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.2 (11.3, 13.4) [mm]
Power drift: -0.00 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/02/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040202-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.6 (Celsius)
Start Power; 250mW

SAR target at 1W is 11.17 mW/g (1g avg, including drift)
SAR target at 1W is 7.11 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.15 mW/g (1g avg). Percent from target (including drift) is -0.22 %
SAR calculated at 1W is 7.14 mW/g (10g avg). Percent from target (including drift) is 0.37 %

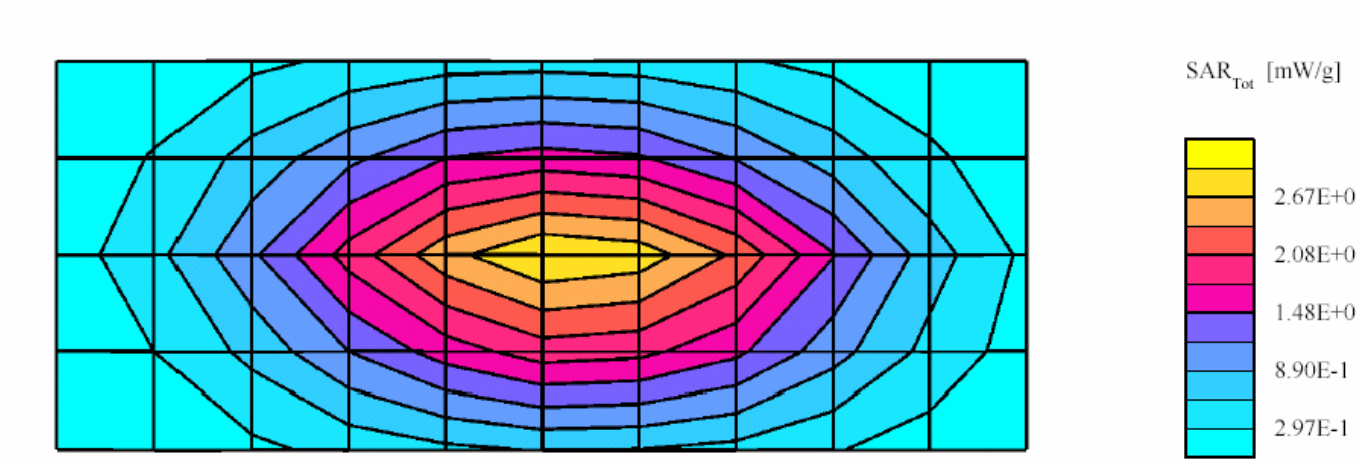
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ = 1.03 mho/m ε = 52.6 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.31 mW/g ± 0.03 dB, SAR (1g): 2.78 mW/g ± 0.04 dB, SAR (10g): 1.78 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.2 (11.3, 13.4) [mm]
Power drift: -0.01 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/02/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040202-03
TX Freq: 900 MHz
Sim Tissue Temp: 21.6 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.72 mW/g (1g avg). Percent from target (including drift) is - 2.30 %
SAR calculated at 1W is 7.34 mW/g (10g avg). Percent from target (including drift) is - 2.43 %

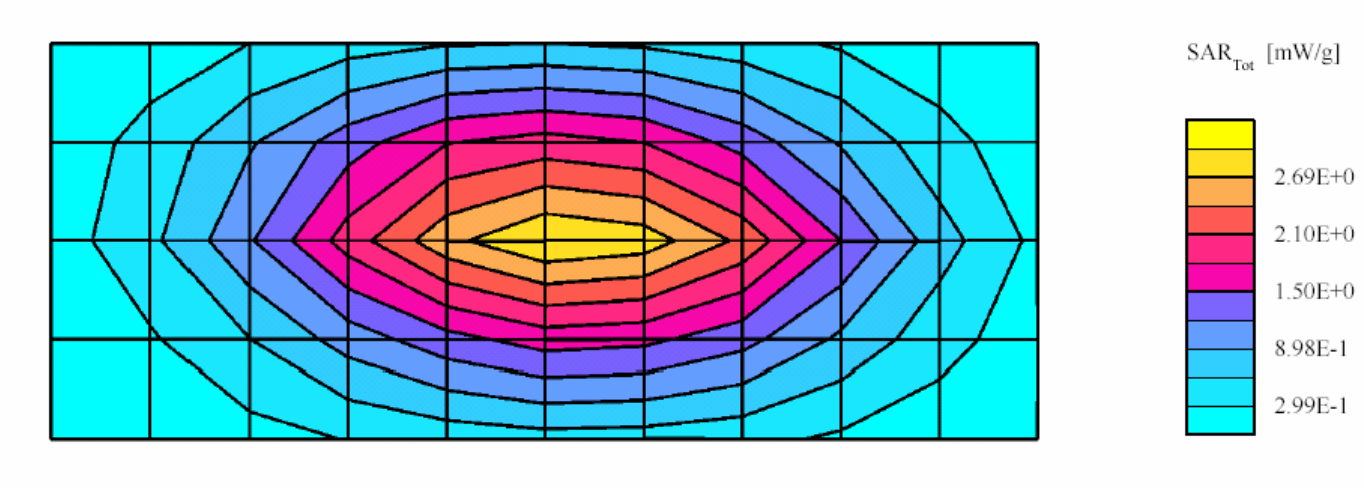
SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 41.2 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.82 mW/g ± 0.01 dB, SAR (1g): 3.02 mW/g ± 0.02 dB, SAR (10g): 1.89 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.4, 12.2) [mm]
Power drift: 0.13 dB



SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/03/04
Motorola CGISS EME Lab
Run #: Sys Perf-R1-040203-01
TX Freq: 900 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power; 250mW

SAR target at 1W is 12.00 mW/g (1g avg, including drift)
SAR target at 1W is 7.52 mW/g (10g avg, including drift)
SAR calculated at 1W is 11.82 mW/g (1g avg). Percent from target (including drift) is - 1.47 %
SAR calculated at 1W is 7.39 mW/g (10g avg). Percent from target (including drift) is - 1.67 %

SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ;Probe Cal Date: 16/04/03ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: σ = 1.01 mho/m ε = 40.8 ρ = 1.00 g/cm3; DAE3: 374V1 DAE Cal Date: 02/19/2003
Cubes (2): Peak: 4.77 mW/g ± 0.01 dB, SAR (1g): 2.99 mW/g ± 0.00 dB, SAR (10g): 1.87 mW/g ± 0.00 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.5, 12.2) [mm]
Power drift: 0.05 dB



SYSTEM VALIDATION

Date:	12/16/2003	Frequency (MHz):	900
Lab Location:	CGISS	Mixture Type:	IEEE Head
Robot System:	CGISS-3	Ambient Temp.(°C):	22.8
Probe Serial #:	ET3DV6-1393	Tissue Temp.(°C):	20.9
DAE Serial #:	406		

Tissue Characteristics

Permitivity:	41.5	Phantom Type/SN:	SAMTP1208
Conductivity:	1.00	Distance (mm):	15 (tissue/dipole cnt)

Reference Source: 900V2 (Dipole)
Reference SN: 85

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

Target SAR Value: 10.8 mW/g, 6.9 mW/g (10g avg.)
(normalized to 1.0 W)

Measured SAR Value: 3 mW/g, 1.88 mW/g (10g avg.)
Power Drift: 0 dB

Measured SAR Value: 12.00 mW/g, 7.52 mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty): 11.11 % (1g ave)
8.99 % (10g ave)

Test performed by: Edward R. Church Initial: E. C

SPEAG DIPOLE D900V2; Test date:12/16/03

Run #: Sys Val-R3-031216-03
Model #: D900V2
Robot: CGISS-3
TX Freq: 900 MHz
Start Power; 250mW
DAE3: SN: 406

Phantom #:SAMTP1208
SN: 085
Tester: E. Church
Sim Tissue Temp: 20.9 (Celsius)

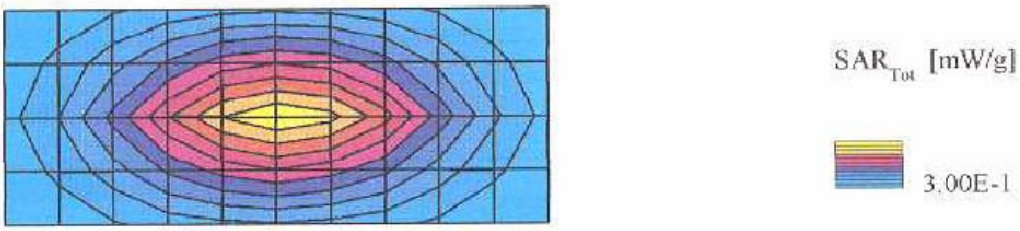
DAE Cal Date: 11/20/03

- Comments-

IEEE 1528 Target at 1W is 10.04 mW/g (1g) and 6.9 mW/g (10g avg.)

SAR calculated 1g is 11.96 mW/g percet from target (including drift) + 10.74 %
SAR Calculated 10g is 7.52 mW/g Percent from target (including drift) is + 8.99 %

SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head 900 MHz: υ – 1.00 mho/m ε_r = 41.5 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.78 mW/g ± 0.04 dB, SAR (1g): 3.00 mW/g ± 0.04 dB, SAR (10g): 1.88 mW/g ± 0.05 dB, (Worst-case extrapolation)
Penetration depth: 11.2 (10.5, 12.3) [mm]
Powerdrift: 0.00 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	12/16/2003	Frequency (MHz):	900
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS-3	Ambient Temp.(°C):	22.7
Probe Serial #:	ET3DV6-1393	Tissue Temp.(°C):	21
DAE Serial #:	406		

Tissue Characteristics

Permitivity:	52.6	Phantom Type/SN:	80302002A-S8
Conductivity:	1.03	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	900	(Dipole)
Reference SN:	85	

Power to Dipole: 250 mW

Measured SAR Value:	2.78	mW/g,	1.77	mW/g (10g avg.)
Power Drift:	-0.02	dB		

New Target/Measured SAR Value: (normalized to 1.0 W, including drift)	11.17	mW/g,	7.11	mW/g (10g avg.)

Test performed by: Edward R. Church Initial: E. C

SPEAG DIPOLE D900V2; Test date:12/16/03

Run #: Sys Perf-R3-031216-06
Model #: D900V2
Robot: CGISS-3
TX Freq: 900 MHz
Start Power; 250mW
DAE3: SN: 406

Phantom #:80302002A-S8
SN: 085
Tester: E. Church
Sim Tissue Temp: 21.0 (Celsius)

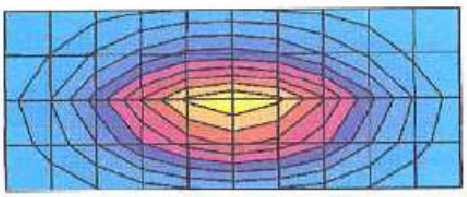
DAE Cal Date: 11/20/03

- Comments-

New Target at 1W is calc SAR values 11.17 mW/g (1g) and 7.11 mW/g (10g avg.)

SAR calculated 1g is 11.17 mW/g percet from target (including drift) 0 %
SAR Calculated 10g is 7.11 mW/g Percent from target (including drift) is 0 %

Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC Body 900MHz: σ = 1.03 mho/m ε_r = 52.6 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.34 mW/g ± 0.03 dB, SAR (1g): 2.78 mW/g ± 0.03 dB, SAR (10g): 1.77 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 12.1 (11.2, 13.3) [mm]
Powerdrift: -0.02 dB



SAR_{Tot} [mW/g]

2.73E-1

APPENDIX D

Calibration Certificates

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

Client **Motorola CGISS**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1393
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	April 16, 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	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03	Apr-04
Power sensor HP 8481A	MY41092180	18-Sep-02	Sep-03
Power meter EPM E4419B	GB41293874	13-Sep-02	Sep-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

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

Date issued: April 16, 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:1393

Sensitivity in Free Space

Diode Compression

NormX	1.80 $\mu V/(V/m)^2$	DCP X	94	mV
NormY	1.49 $\mu V/(V/m)^2$	DCP Y	94	mV
NormZ	1.80 $\mu V/(V/m)^2$	DCP Z	94	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 IEEE P1528-200X

ConvF X	**7.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**7.0** ± 9.5% (k=2)	Alpha	**0.31**
ConvF Z	**7.0** ± 9.5% (k=2)	Depth	**2.71**

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 IEEE P1528-200X

ConvF X	**5.5** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.5** ± 9.5% (k=2)	Alpha	**0.48**
ConvF Z	**5.5** ± 9.5% (k=2)	Depth	**2.51**

Boundary Effect

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

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	9.0	5.3
SAR_{be} [%]	With Correction Algorithm	0.3	0.5

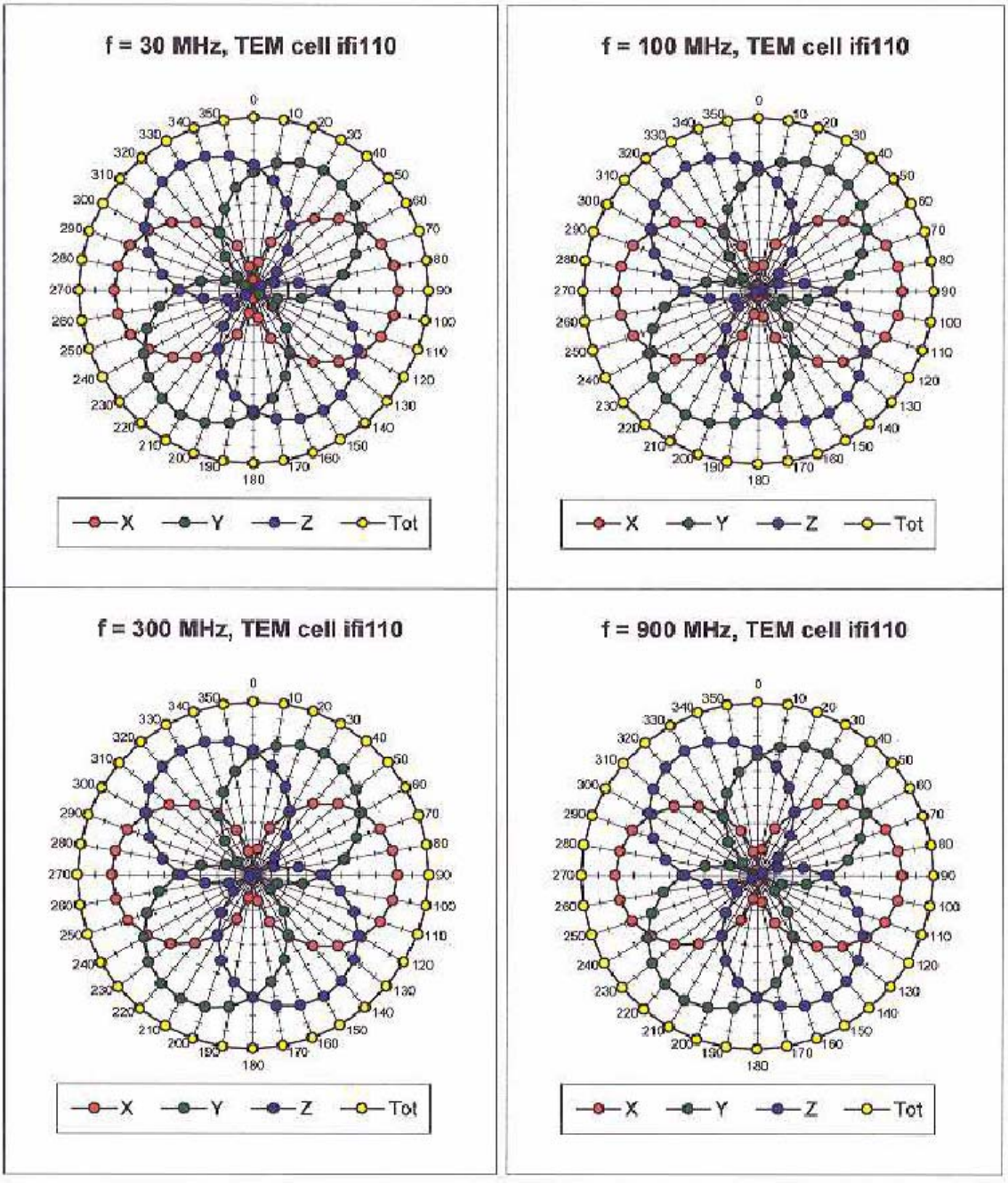
Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

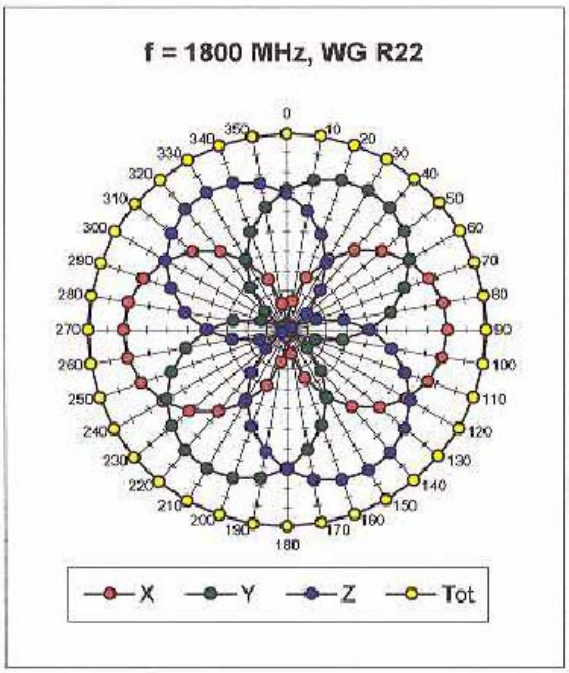
Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	12.2	8.3
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

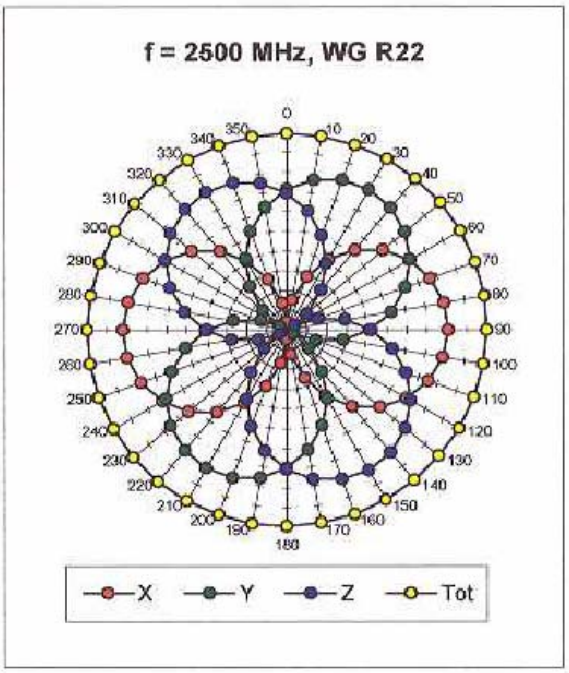
Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**0.9 ± 0.2**	mm

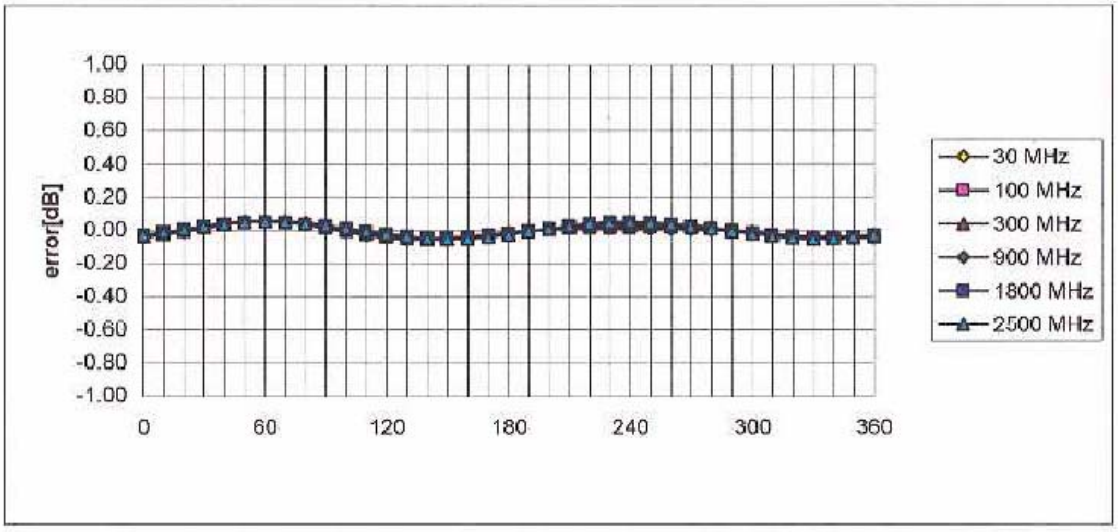
Receiving Pattern (ϕ , θ = 0°





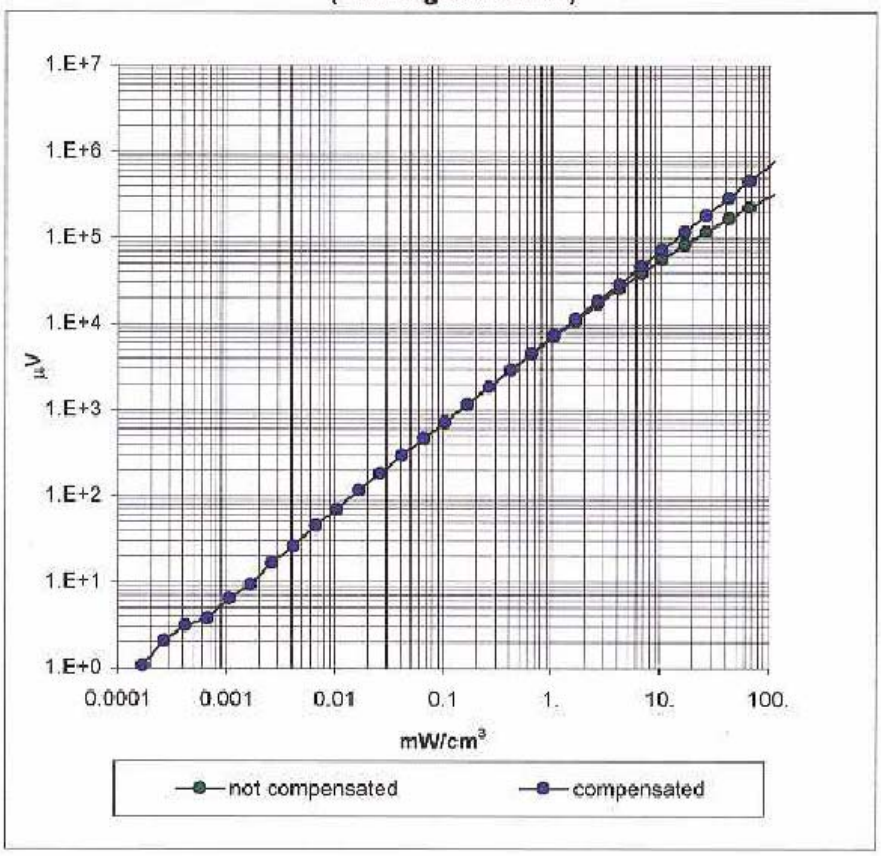


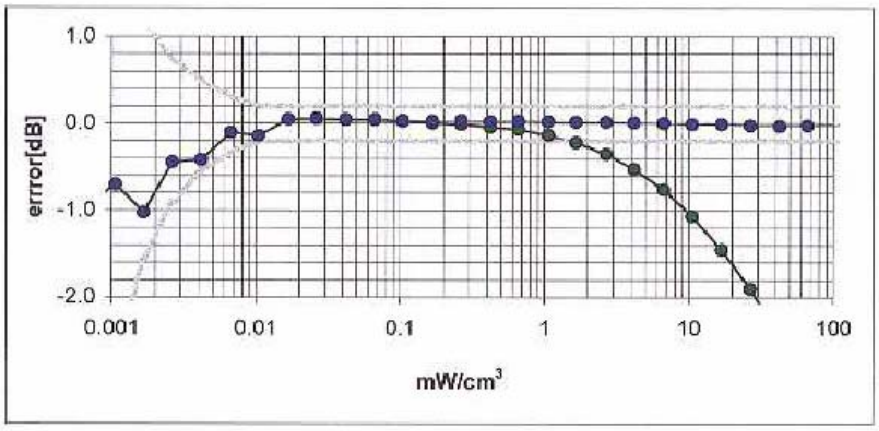
Isotropy Error (ϕ), θ = 0°



Dynamic Range f(SAR_{brain})

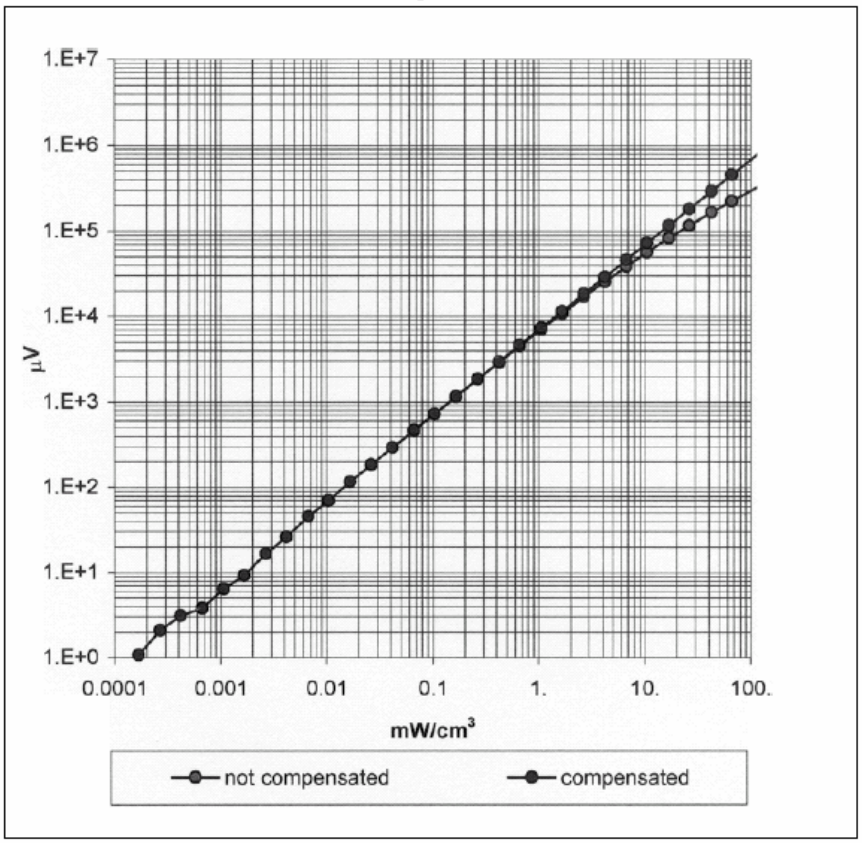
(Waveguide R22)

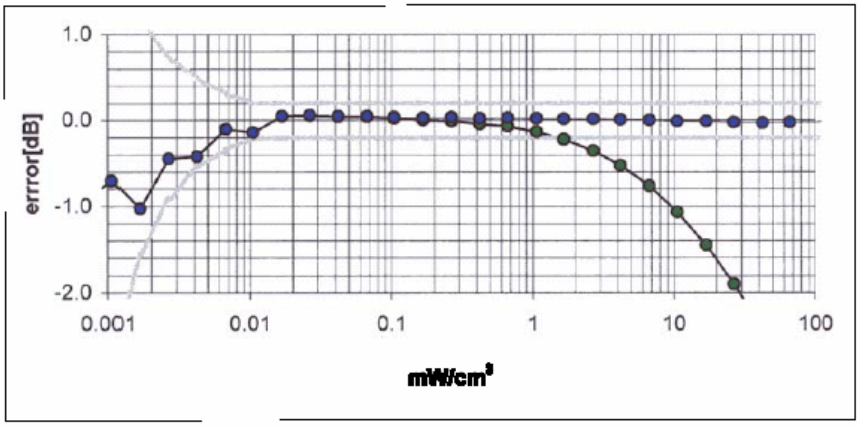




Dynamic Range f(SAR_{brain})

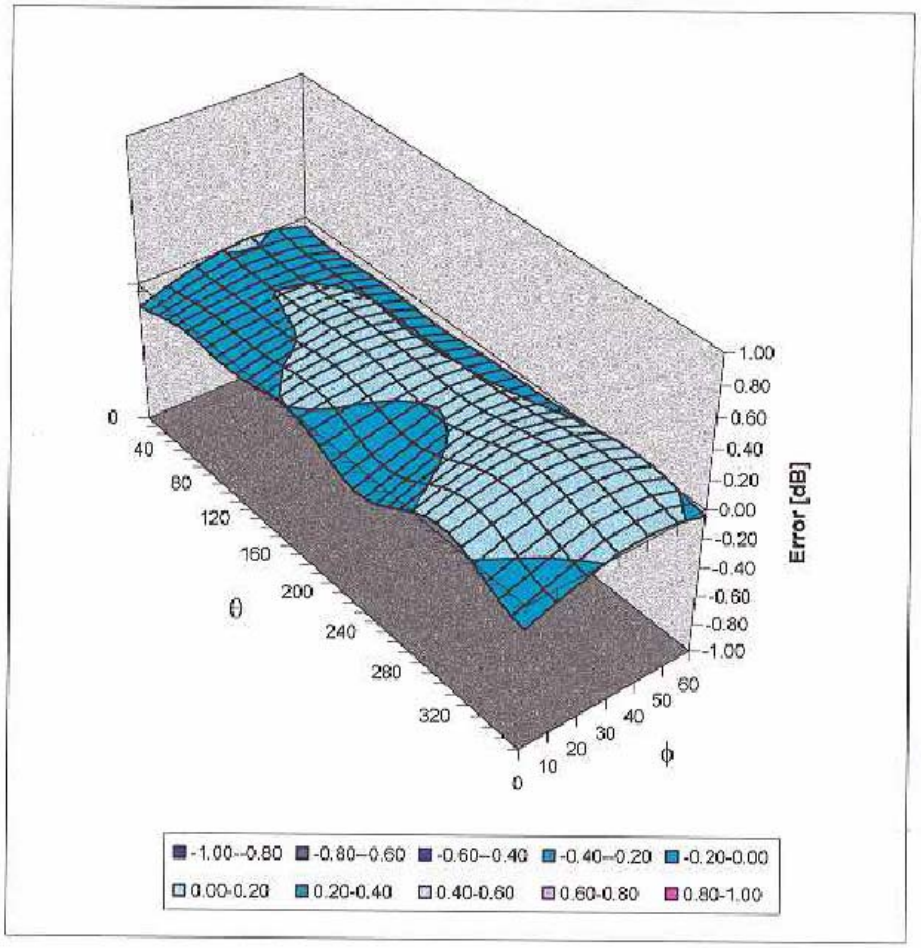
(Waveguide R22)





Deviation from Isotropy in HSL

Error ($\theta\phi$), f = 900 MHz



Schmid & Partner
Engineering AG

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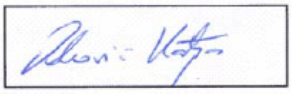
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1393**
Place of Assessment:	**Zurich**
Date of Assessment:	**April 21, 2003**
Probe Calibration Date:	**April 16, 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:



Dosimetric E-Field Probe ET3DV6 SN:1393

Conversion factor (± standard deviation)

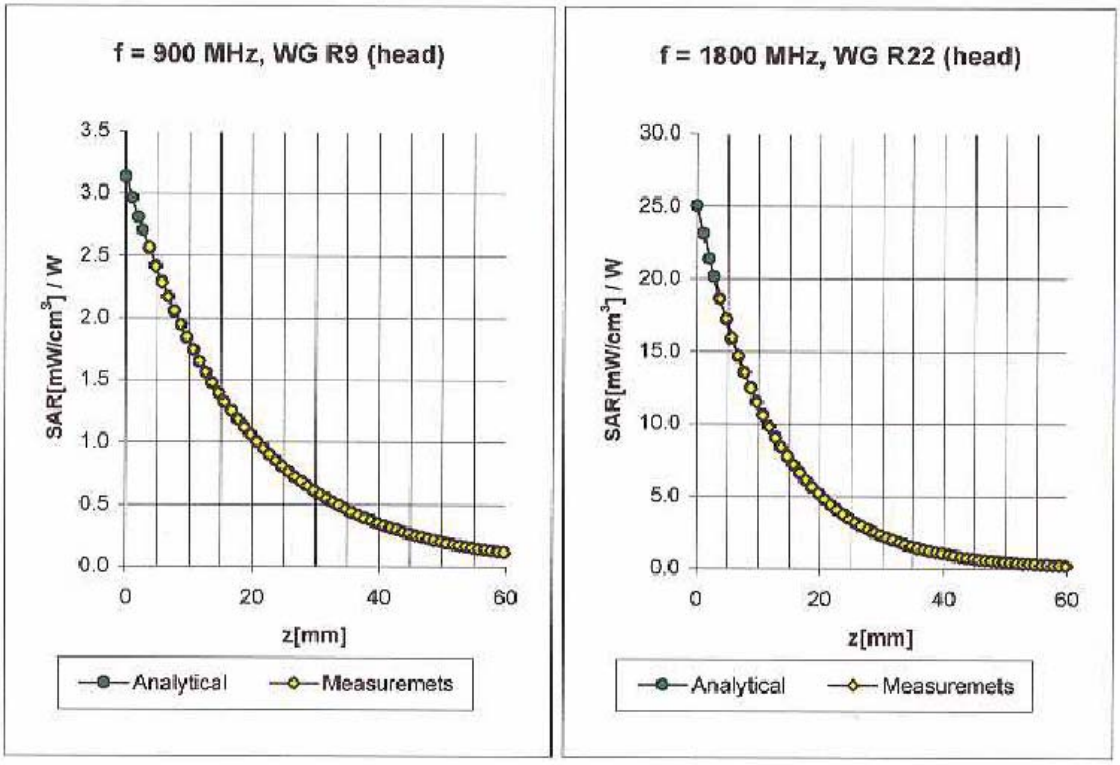
150 MHz	ConvF	**8.8 ± 8 %**	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
236 MHz	ConvF	**8.6 ± 8 %**	**ε_r = 59.8** **σ = 0.87 mho/m** **(body tissue)**
300 MHz	ConvF	**8.4 ± 8 %**	**ε_r = 58.2** **σ = 0.92 mho/m** **(body tissue)**
350 MHz	ConvF	**8.4 ± 8 %**	**ε_r = 57.7** **σ = 0.93 mho/m** **(body tissue)**
450 MHz	ConvF	**8.0 ± 8 %**	ε_r = 56.7 σ = 0.94 mho/m (body tissue)
784 MHz	ConvF	**7.0 ± 8 %**	ε_r = 55.4 σ = 0.97 mho/m (body tissue)
1450 MHz	ConvF	**5.6 ± 8 %**	ε_r = 54.0 σ = 1.30 mho/m (body tissue)

Dosimetric E-Field Probe ET3DV6 SN:1393

Conversion factor (± standard deviation)

150 MHz	ConvF	**9.7 ± 8%**	**ε_r = 52.3** **σ = 0.76 mho/m** **(head tissue)**
236 MHz	ConvF	**8.8 ± 8%**	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz	ConvF	**8.5 ± 8%**	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz	ConvF	**8.5 ± 8%**	**ε_r = 44.7** **σ = 0.87 mho/m** **(head tissue)**
400 MHz	ConvF	**8.1 ± 8%**	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz	ConvF	**8.1 ± 8%**	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz	ConvF	**7.3 ± 8%**	ε_r = 41.8 σ = 0.90 mho/m (head tissue)

Conversion Factor Assessment



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 IEEE P1528-200X

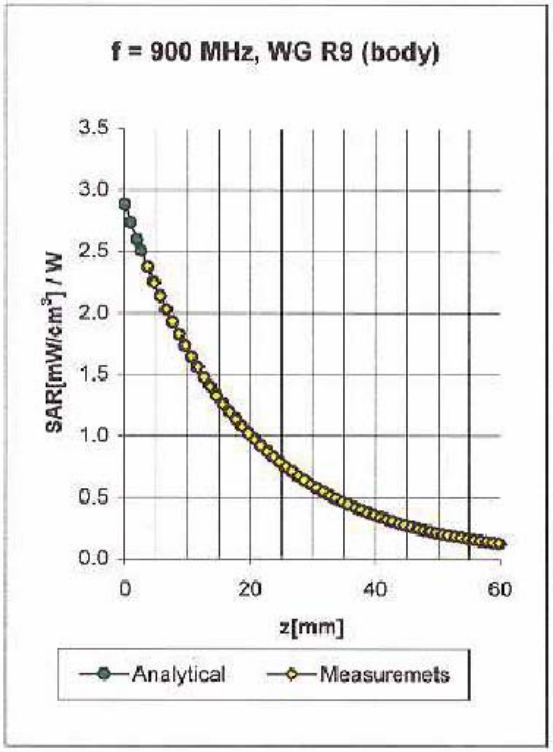
ConvF X	**7.0** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**7.0** ± 9.5% (k=2)	Alpha	**0.31**
ConvF Z	**7.0** ± 9.5% (k=2)	Depth	**2.71**

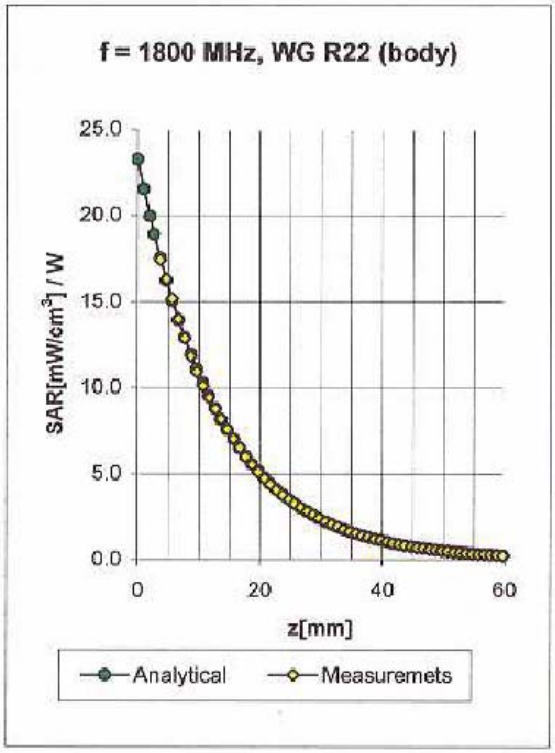
Head **1800 MHz** ε_r = **40.0 ± 5%** σ = **1.40 ± 5% mho/m**

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

ConvF X	**5.5** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.5** ± 9.5% (k=2)	Alpha	**0.48**
ConvF Z	**5.5** ± 9.5% (k=2)	Depth	**2.51**

Conversion Factor Assessment





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

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**6.8** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.8** ± 9.5% (k=2)	Alpha	**0.35**
ConvF Z	**6.8** ± 9.5% (k=2)	Depth	**2.48**

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

Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**5.1** ± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.1** ± 9.5% (k=2)	Alpha	**0.51**
ConvF Z	**5.1** ± 9.5% (k=2)	Depth	**2.79**

Schmid & Partner
Engineering AG

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

Calibration Certificate

900 MHz System Validation Dipole

Type:	**D900V2**
Serial Number:	**085**
Place of Calibration:	**Zurich**
Date of Calibration:	**August 27, 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:	N. Vetter
Approved by:	Katja Pokovic

1. Measurement Conditions

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

Relative Dielectricity	**41.7**	± 5%
Conductivity	**0.97 mho/m**	± 5%

The DASY System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.5 at 900 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance 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 250mW ± 3 %. The results are normalized to 1W input power.

2.1. SAR Measurement with DASY3 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 worst-case extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**11.0 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.92 mW/g**

2.2 SAR Measurement with DASY4 System

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

averaged over 1 cm^3 (1 g) of tissue:	**10.3 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.64 mW/g**

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:	**1.389 ns**	(one direction)
Transmission factor:	**0.991**	(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 900 MHz:	Re{Z} = **50.1 Ω**
	Im {Z} = **-3.9 Ω**
Return Loss at 900 MHz	**-28.3 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.

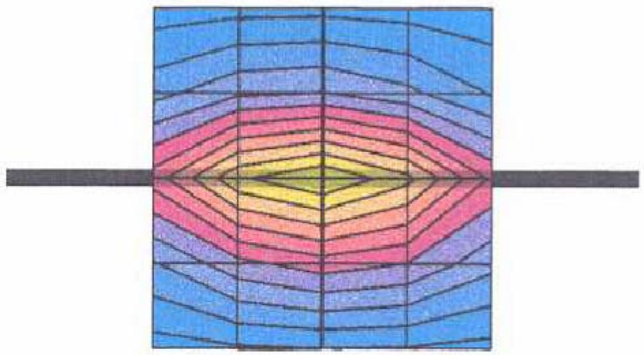
6. Power Test

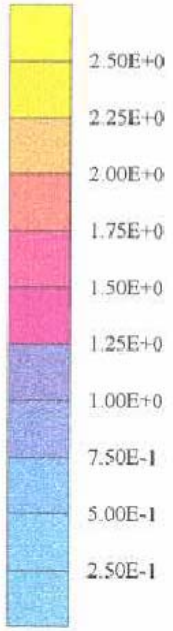
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

08/27/02

Validation Dipole D900V2 SN:085, d=15 mm

Frequency: 900 MHz; Antenna Input Power: 250 [mW]
SAM Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.50,6.50,6.50) at 900 MHz; IEEE 1528 900 MHz: σ = 0.97 mho/m ε_r = 41.7 ρ = 1.00 g/cm³
Cubes (2): Peak: 4.34 mW/g ± 0.01 dB, SAR (1g): 2.74 mW/g ± 0.01 dB, SAR (10g): 1.73 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.6 (10.8, 12.8) [mm]
Powerdrift: -0.00 dB

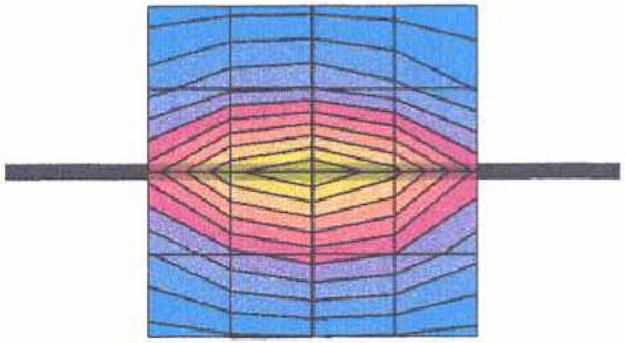


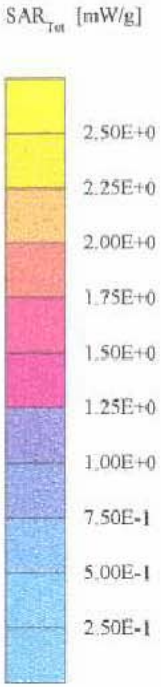


08/27/02

Validation Dipole D900V2 SN:085, d=15 mm

Frequency: 900 MHz; Antenna Input Power: 250 [mW]
SAM Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(6.50,6.50,6.50) at 900 MHz; IEEE 1528 900 MHz: σ = 0.97 mho/m ε_r = 41.7 ρ = 1.00 g/cm^3
Cubes (2): Peak: 3.85 mW/g ± 0.01 dB, SAR (1g): 2.57 mW/g ± 0.01 dB, SAR (10g): 1.66 mW/g ± 0.02 dB, (Advanced extrapolation)
Penetration depth: 12.6 (12.4, 12.9) [mm]
Powerdrift: -0.00 dB





Schmid & Partner Engineering AG, Zurich, Switzerland

APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT5828. 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 NNTN4747A
Back View

Photo 2.
Model NNTN4747A
Side View

Photo 3.
Model NNTN5002A
Back View

Photo 4.
Model NNTN5002A
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
NNTN4747A	Yes	23-27	NA
NNTN5002A	Yes	31-35	NA

Audio Acc. Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
NNTN4620A	Yes	NA	NA
SYN8146C	Yes	NA	NA
SYN7875C	Yes	NA	NA
NTN8496A	Yes	NA	NA
NTN8513B	Yes	NA	NA
SYN8390B	Yes	NA	NA
NNTN4033A	Yes	NA	NA
NSN6066A	Yes	NA	NA
NNTN5004A	Yes	NA	NA
NNTN5005A	Yes	NA	NA

Data cables Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
NKN6560A	Yes	NA	NA
NKN6559A	Yes	NA	NA

Other attachments Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
1585164F01	Yes	NA	Tested w/ 700mAh battery
1585169F02	Yes	NA	Tested w/ 950mAh battery