



**MOTOROLA**



**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 19, 2004  
**Report Revision:** Rev. O  
**Manufacturer:** Motorola  
**Product Description:** i325; Dual mode iDEN: 1:6, 1:3, 81:120, 1:12  
TDMA; 64 QAM, 16 QAM & QPSK Modulation;  
0.6 W Pulse average nominal; MOTotalk: 114:120  
8FSK, 0.85W nominal GPS capable  
**FCC ID:** **AZ489FT5830**  
**Device Model:** H68XAH6RR1AN

**Test Period:** 2/8/04-2/13/04

**EME Tech:** Ed Church

**EME Eng.:** Stephen Whalen (Sr. EME 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

2/19/04

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

\_\_\_\_\_  
Date Approved

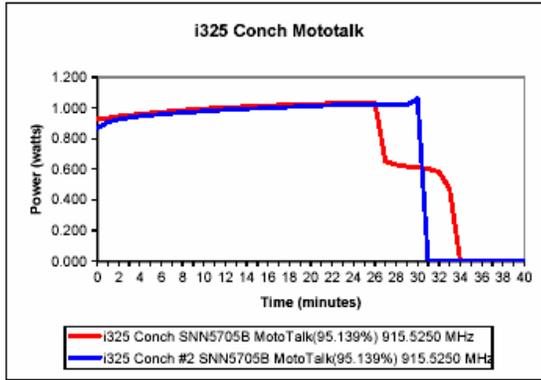
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## **APPENDIX A**

### **Power Slump Data/Shortened Scan**

## DUT Power versus time data

| Time(minutes) | i325 Conch<br>SNN5705B<br>MotoTalk(95.139%)<br>915.5250 MHz<br>Power(watts) | i325 Conch #2<br>SNN5705B<br>MotoTalk(95.139%)<br>915.5250 MHz<br>Power(watts) |
|---------------|---|--|
| 0             | 0.924   | 0.866  |
| 1             | 0.934   | 0.908  |
| 2             | 0.945   | 0.925  |
| 3             | 0.953   | 0.936  |
| 4             | 0.961   | 0.945  |
| 5             | 0.967   | 0.953  |
| 6             | 0.974   | 0.959  |
| 7             | 0.980   | 0.963  |
| 8             | 0.985   | 0.969  |
| 9             | 0.990   | 0.974  |
| 10            | 0.995   | 0.979  |
| 11            | 0.999   | 0.983  |
| 12            | 1.003   | 0.987  |
| 13            | 1.006   | 0.991  |
| 14            | 1.009   | 0.995  |
| 15            | 1.012   | 0.998  |
| 16            | 1.015   | 1.001  |
| 17            | 1.018   | 1.004  |
| 18            | 1.021   | 1.007  |
| 19            | 1.024   | 1.010  |
| 20            | 1.026   | 1.013  |
| 21            | 1.028   | 1.015  |
| 22            | 1.030   | 1.017  |
| 23            | 1.032   | 1.019  |
| 24            | 1.034   | 1.020  |
| 25            | 1.035   | 1.022  |
| 26            | 1.036   | 1.022  |
| 27            | 0.650   | 1.023  |
| 28            | 0.631   | 1.023  |
| 29            | 0.619   | 1.022  |
| 30            | 0.611   | 1.060  |
| 31            | 0.602   | 0.000  |
| 32            | 0.582   | 0.000  |
| 33            | 0.472   | 0.000  |



## Shortened Scan Results

**FCC ID: AZ489FT5830; Test Date: 2/11/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040211-05

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 813.5125 MHZ Tissue Temp: 20.5 (Celsius)

Start Power: .725 W

Antenna: Fixed

Battery Kit: SNN5706A

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. = 0.927 mW/g; 10-g Avg. = 0.663mW/g**

**“Normal” scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.092 mW/g; 10-g Avg. = 0.772mW/g**

**(see section 7.1 run # EC-Ab-R1-040213-04)**

**DUT back towards the phantom with antenna separated 2.5cm**

Flat Phantom Phantom; Device Section; Position: (90°,90°);

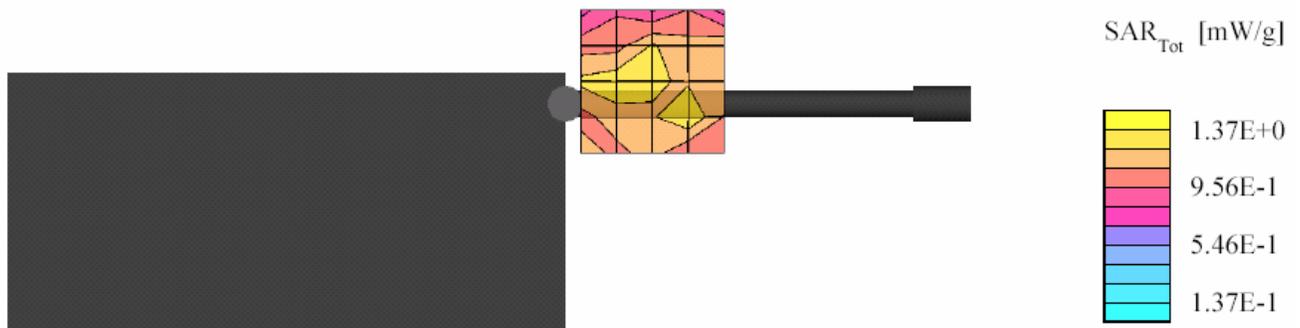
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 1.5; FCC

Body 813 MHz:  $\rho = 0.94$  mho/m  $\mu = 53.6$  = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 5x5x7: SAR (1g): 0.927 mW/g, SAR (10g): 0.663 mW/g, (Worst-case extrapolation)

Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 0.927 mW/g, SAR (10g): 0.663 mW/g

Power Drift: -0.11 dB



**FCC ID: AZ489FT5830; Test Date: 2/13/04**

**Motorola CGISS EME Laboratory**

Run #: EC-Lear-R1-040213-02

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 898.49375 MHz

Sim Tissue Temp: 21.0 (Celsius)

Start Power: 0.669 W

Antenna: Fixed

Battery Kit: SNN5705B

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. = 0.978 mW/g; 10-g Avg. = 0.643 mW/g**

**“Normal” scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.055 mW/g; 10-g Avg. = 0.686 mW/g**

**(see section 7.1 run # EC-Lear-R1-040208-14)**

**DUT at the Left ear in 15 ° tilt position**

SAM; Position: (90°,59°);

Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 3.0; IEEE

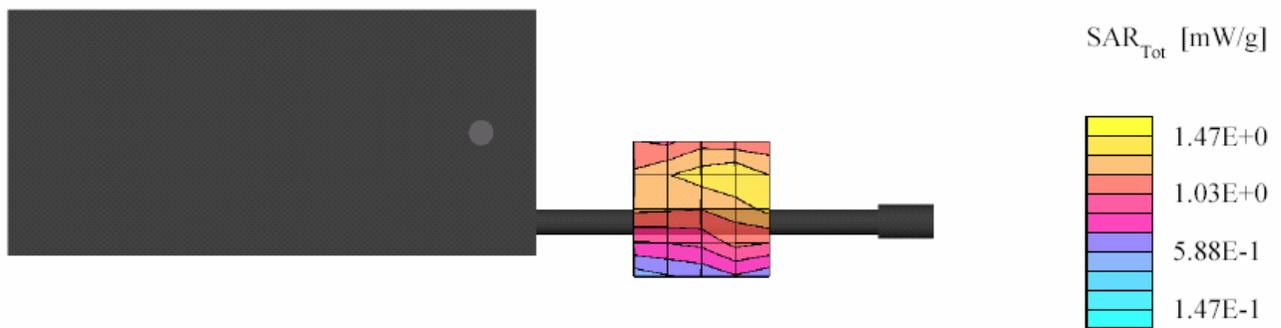
Head 899 MHz: = 1.00 mho/m = 40.8 = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 5x5x7: SAR (1g): 0.935 mW/g, SAR (10g): 0.615 mW/g \* Max outside, (Worst-case extrapolation)

Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 0.935 mW/g, SAR (10g): 0.615 mW/g \* Max outside

Power Drift: 0.04 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 B**  
**Data Results**

**FCC ID: AZ489FT5830; Test Date: 2/11/04**

**Motorola CGISS EME Laboratory**

Run #: Rear-R1-040211-18

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 806.0125 MHz

Tissue Temp: 20.3 (Celsius)

Start Power: .695 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: NONE

Audio/Data Acc.: NONE

**DUT at right ear in 15 ° Tilt position**

SAM Phantom; Position: (90°,301°);

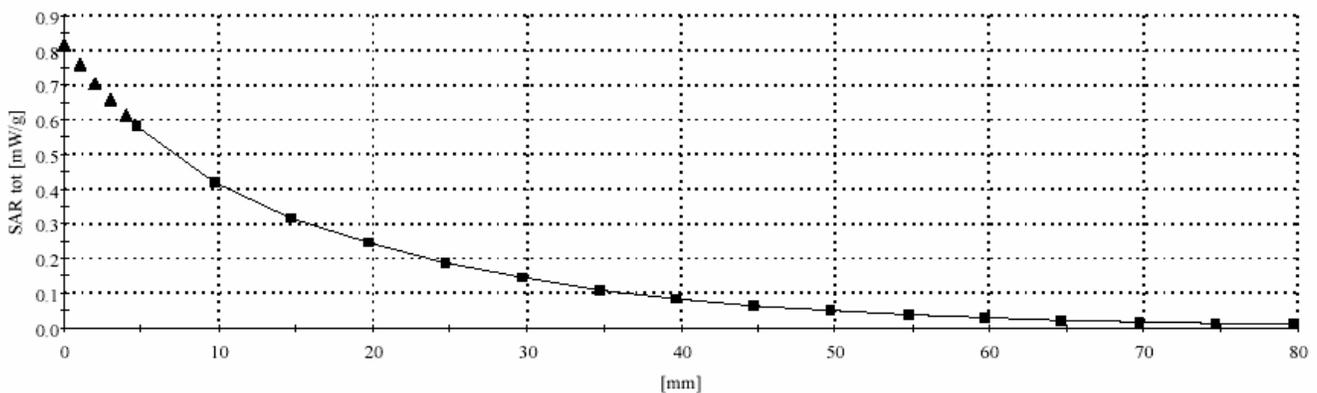
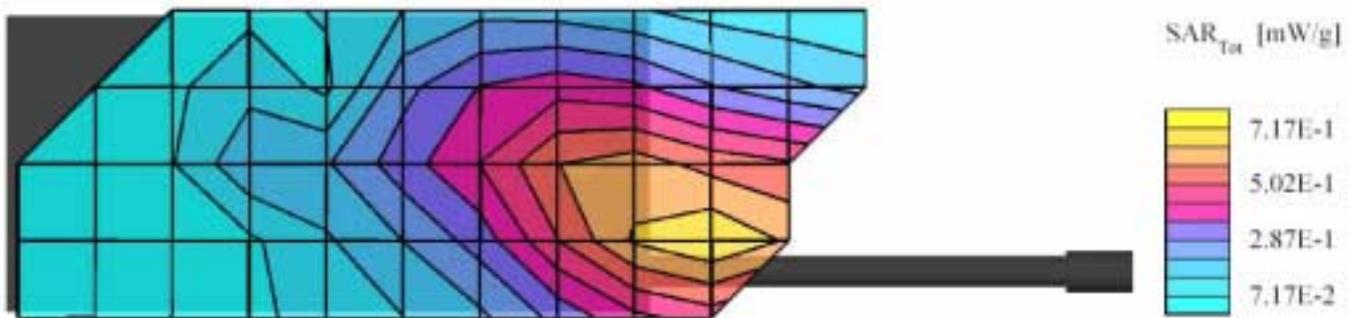
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 3.0; IEEE

Head 813 MHz:  $\rho = 0.93$  mho/m  $\mu = 42.6$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.726 mW/g, SAR (10g): 0.470 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 135.0, 13.5, 4.7

Power Drift: -0.38 dB



**FCC ID: AZ489FT5830; Test Date: 2/11/04**

**Motorola CGISS EME Laboratory**

Run #: Face-R1-040211-20

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 813.5125 MHz

Tissue Temp: 20.2 (Celsius)

Start Power: .687 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: NONE

Audio/Data Acc.: NONE

**DUT front towards phantom with 2.5 cm separation**

SAM Phantom; Flat Section; Position: (90°,90°);

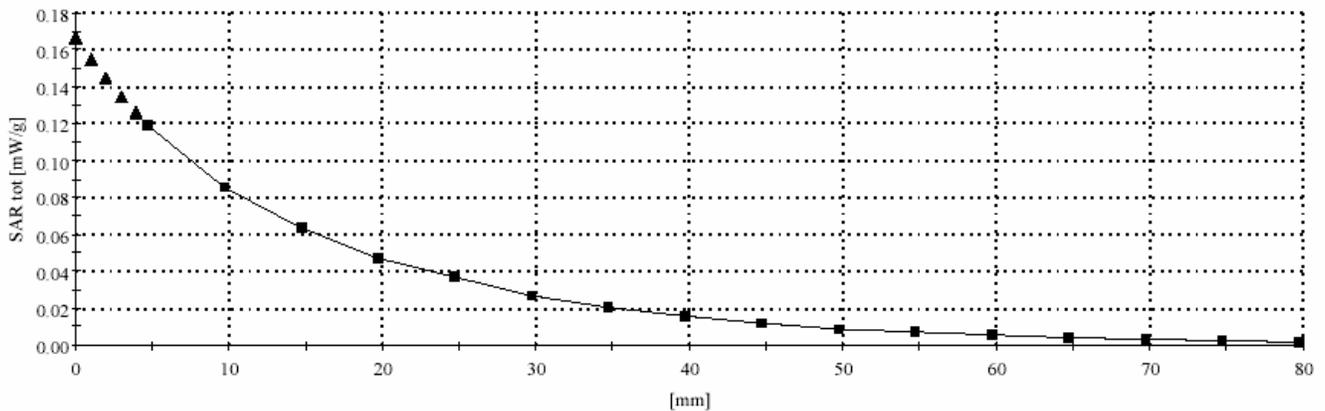
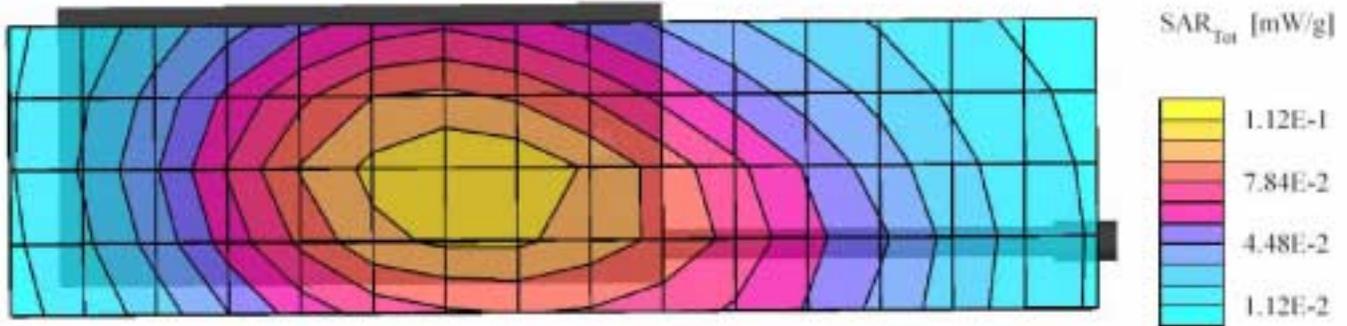
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 6.0; IEEE

Head 813 MHz: = 0.93 mho/m = 42.6 = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.120 mW/g, SAR (10g): 0.0860 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 33.0, 94.5, 4.7

Power Drift: 0.67 dB



**FCC ID: AZ489FT5830; Test Date: 2/8/04**

**Motorola CGISS EME Laboratory**

Run #: Lear-R1-040208-14

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 898.49375 MHZ

Tissue Temp: 20.7 (Celsius)

Start Power: .680 W

Antenna: Fixed

Battery Kit: SNN5705B

Carry Case: NONE

Audio/Data Acc.: NONE

**DUT at left ear in 15 ° Tilt position**

SAM Phantom; Position: (90°,59°);

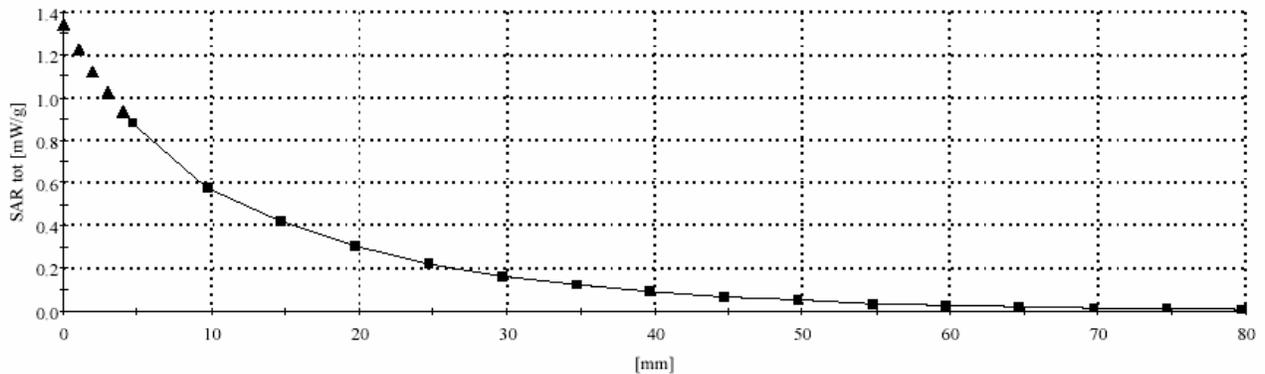
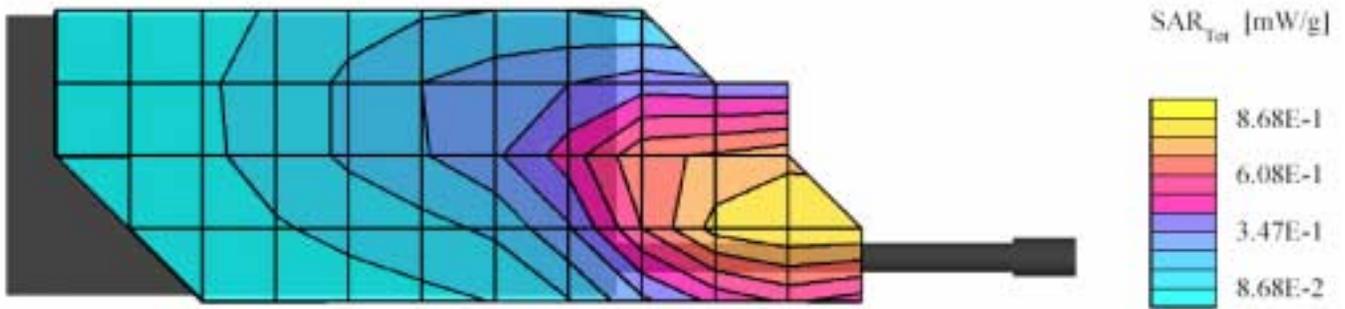
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 3.0; IEEE

Head 899 MHz:  $\sigma = 0.99$  mho/m  $\rho = 40.6$  = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.922 mW/g, SAR (10g): 0.599 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 165.0, 18.0, 4.7

Power drift: -0.46dB



**FCC ID: AZ489FT5830; Test Date: 2/12/04**

**Motorola CGISS EME Laboratory**

Run #: Face-R1-040212-07

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 898.49375 MHZ

Tissue Temp: 20.8 (Celsius)

Start Power: .657 W

Antenna: Fixed

Battery Kit: SNN5705B

Carry Case: NONE

Audio/Data Acc.: NONE

**DUT front towards phantom with 2.5 cm separation distance**

SAM ; Flat Section; Position: (90°,90°);

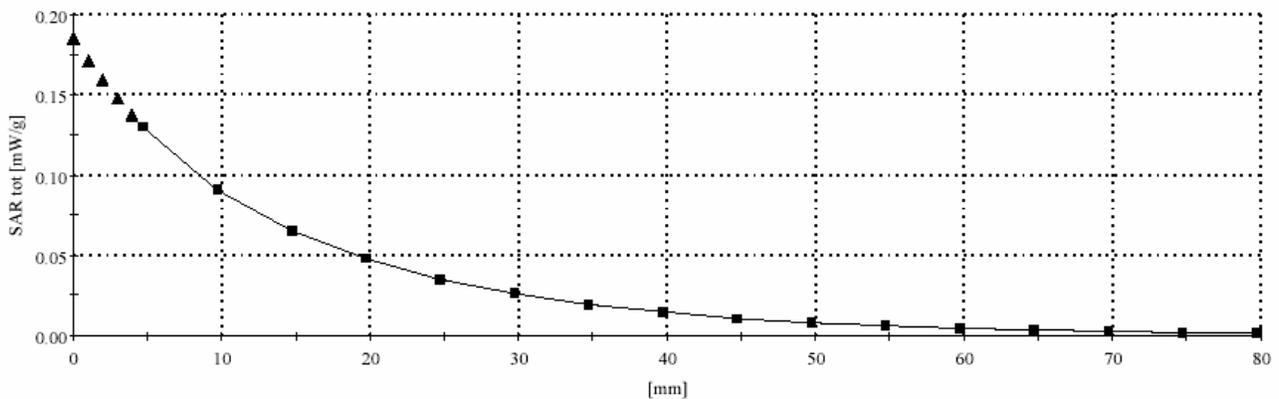
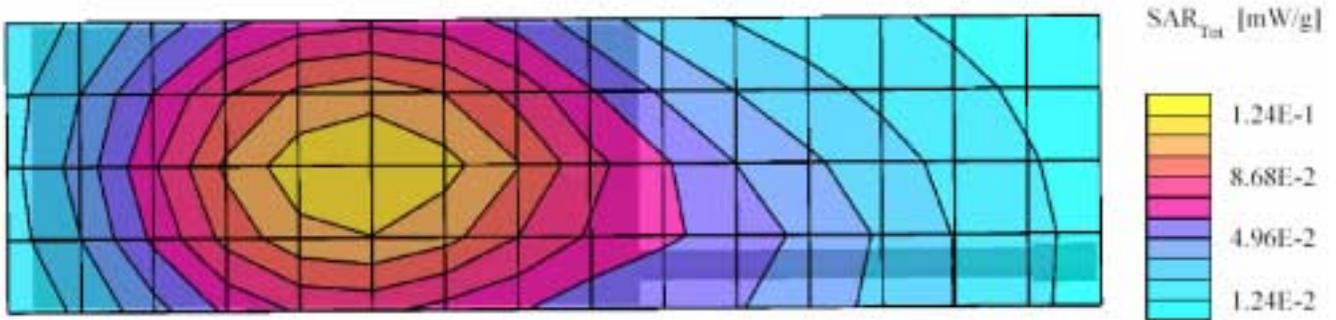
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 6.0; IEEE

Head 899 MHz: = 1.00 mho/m = 40.8 = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.128 mW/g, SAR (10g): 0.0900 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 31.5, 72.0, 4.7

Power Drift: 0.21dB



**FCC ID: AZ489FT5830; Test Date: 2/12/04**

**Motorola CGISS EME Laboratory**

Run #: Face-R1-040212-14

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 902.5250 MHZ

Tissue Temp: 20.8 (Celsius)

Start Power: .846 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: None

Audio/Data Acc.: None

**DUT front towards phantom with 2.5 cm separation distance**

SAM; Flat Section; Position: (90°,90°);

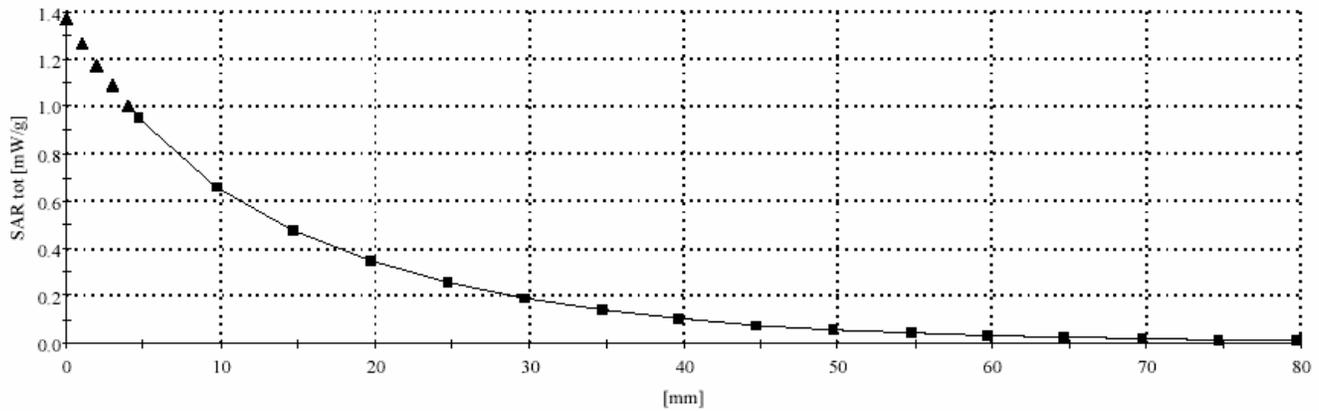
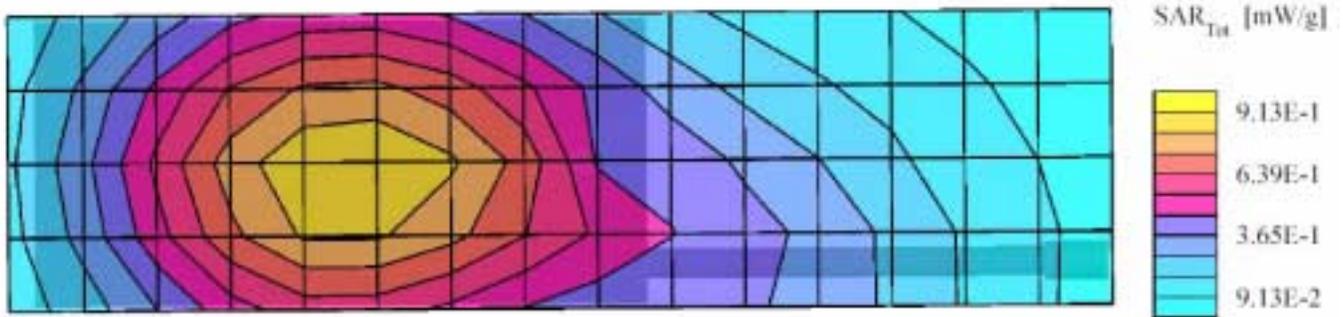
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.60,6.60,6.60); Probe cal date: 15/05/03; Crest factor: 1.1; IEEE

Head 915 MHz: = 1.02 mho/m = 40.6 = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.929 mW/g, SAR (10g): 0.650 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 33.0, 69.0, 4.7

Power Drift: 0.26 dB



**FCC ID: AZ489FT5830; Test Date: 2/10/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040210-11

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 813.5125 MHz

Tissue Temp: 20.5 (Celsius)

Start Power: .722 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: NNTN5210A

Audio/Data Acc.: None

**DUT with holster against the phantom**

Flat Phantom; Device Section; Position: (90°,90°);

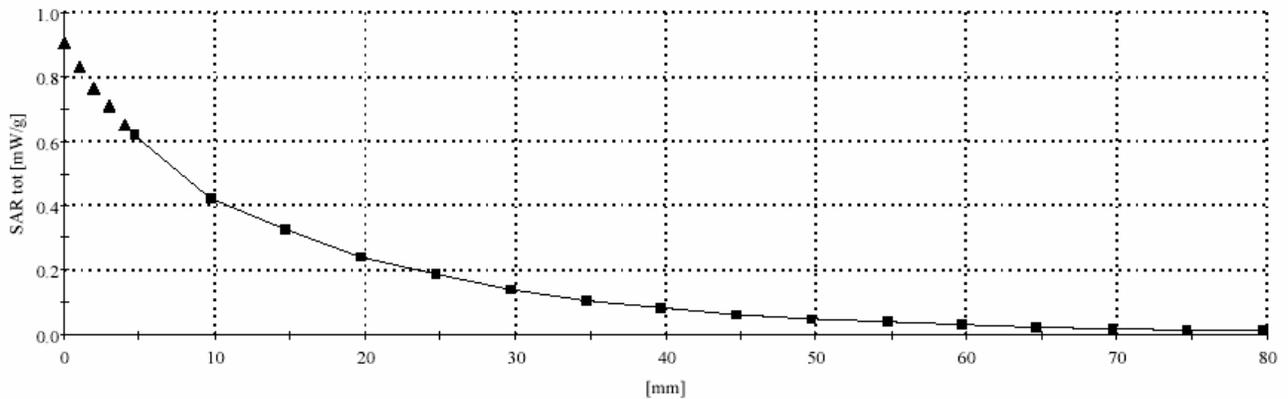
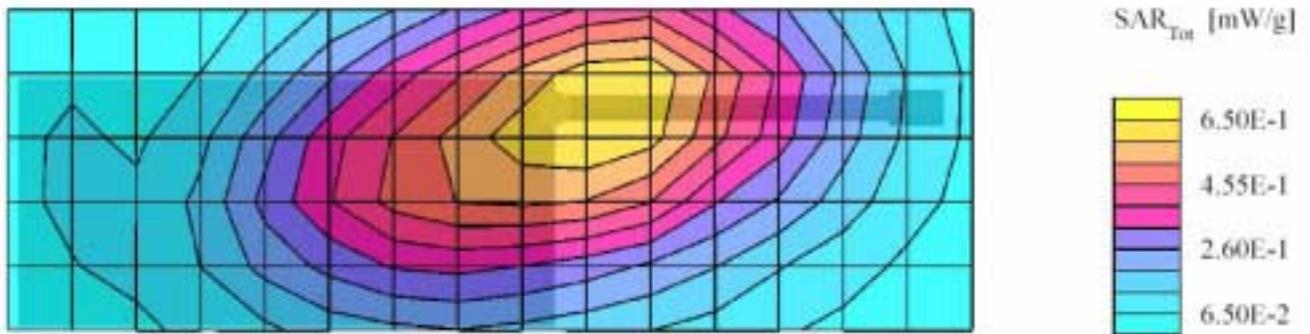
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 1.5; FCC

Body 813 MHz:  $\sigma = 0.94$  mho/m  $\rho = 53.5$  = 1.00 g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.685 mW/g, SAR (10g): 0.484 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 22.5, 141.0, 4.7

Power drift: -0.50 dB



**FCC ID: AZ489FT5830; Test Date: 2/11/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040211-02

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 806.0125 MHz

Tissue Temp: 20.7 (Celsius)

Start Power: .705 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: NNTN5210A

Audio/Data Acc.: None

**DUT with holster against the phantom**

Flat Phantom; Position: (90°,90°);

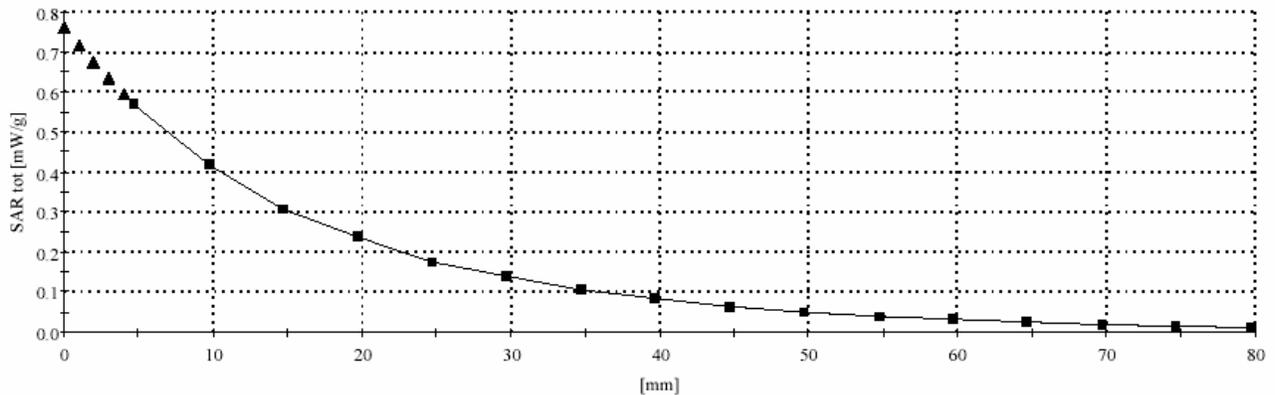
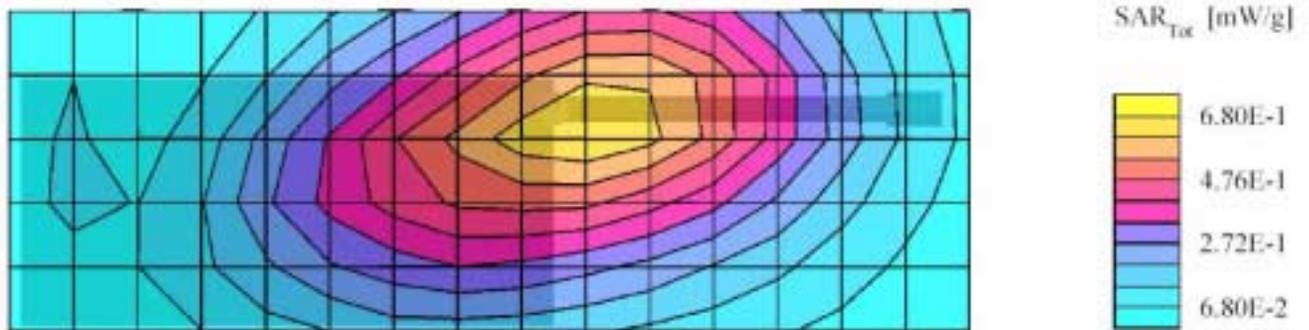
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 1.5; FCC

Body 813 MHz:  $\rho = 0.94$  mho/m  $\mu = 53.6$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.600 mW/g, SAR (10g): 0.430 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 27.0, 135.0, 4.7

Power Drift: -0.33 dB



**FCC ID: AZ489FT5830; Test Date: 2/10/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040210-03

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 898.49375 MHz

Tissue Temp: 20.5 (Celsius)

Start Power: .675 W

Antenna: Fixed

Battery Kit: SNN5705B

Carry Case: NNTN5210A

Audio/Data Acc.: SYN7875C

**DUT with holster against the phantom**

Flat Phantom; Position: (90°,90°);

Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 3.0; FCC

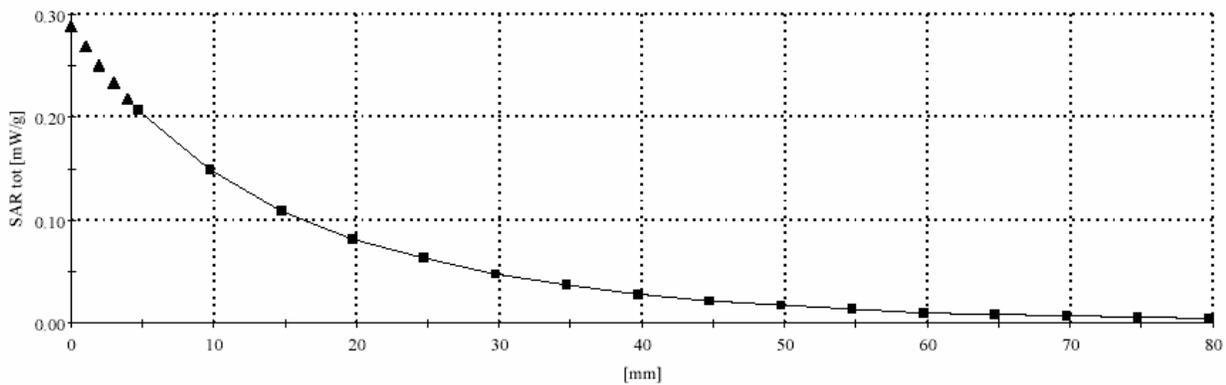
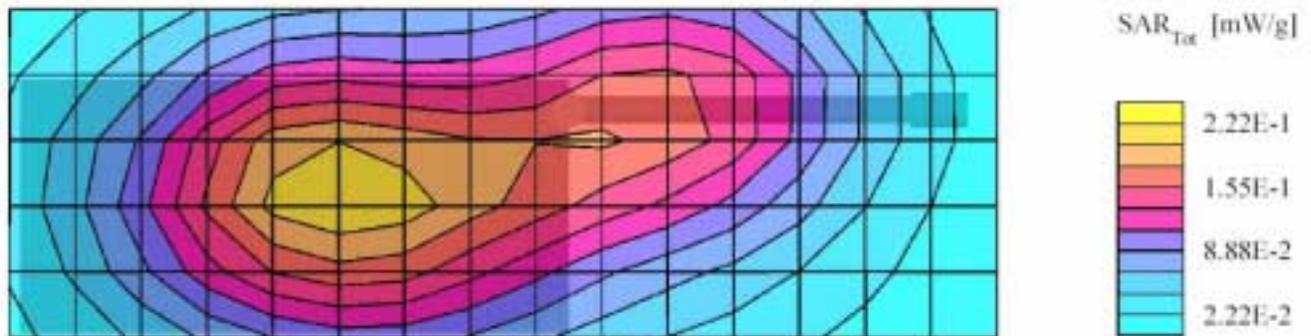
Body 899 MHz:  $\rho = 1.04$  mho/m  $\mu = 52.6$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.223 mW/g, SAR (10g): 0.156 mW/g \* Max outside, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 42.0, 75.0, 4.7

Power drift: -0.41 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: AZ489FT5830; Test Date: 2/9/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040209-03

Model #: H68XAH6RR1AN SN: 364ADY005C

TX Freq: 915.5250 MHZ

Tissue Temp: 20.5 (Celsius)

Start Power: .845 W

Antenna: Fixed

Battery Kit: SNN5705B

Carry Case: NNTN5210A

Audio/Data Acc.: NNTN5208A

**DUT with holster against the phantom**

Flat Phantom; Position: (90°,90°);

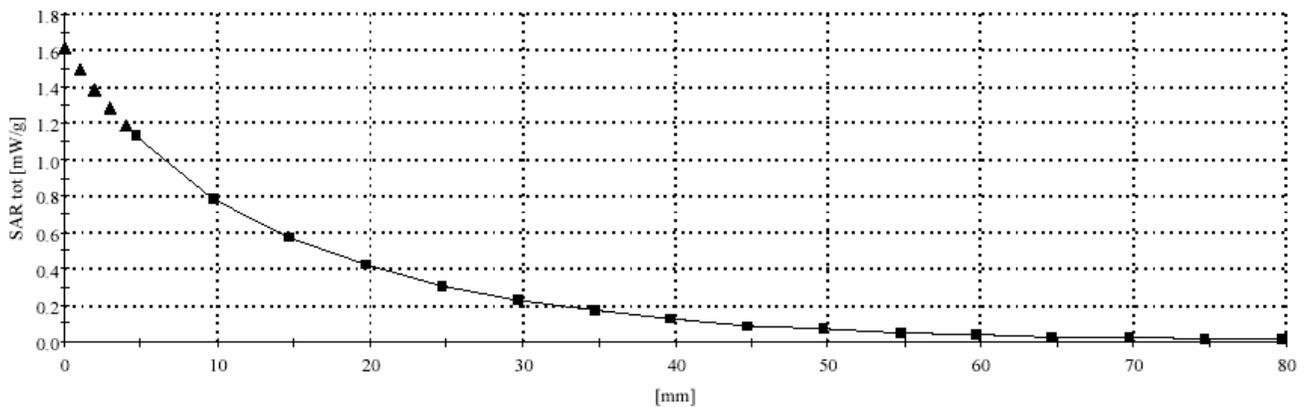
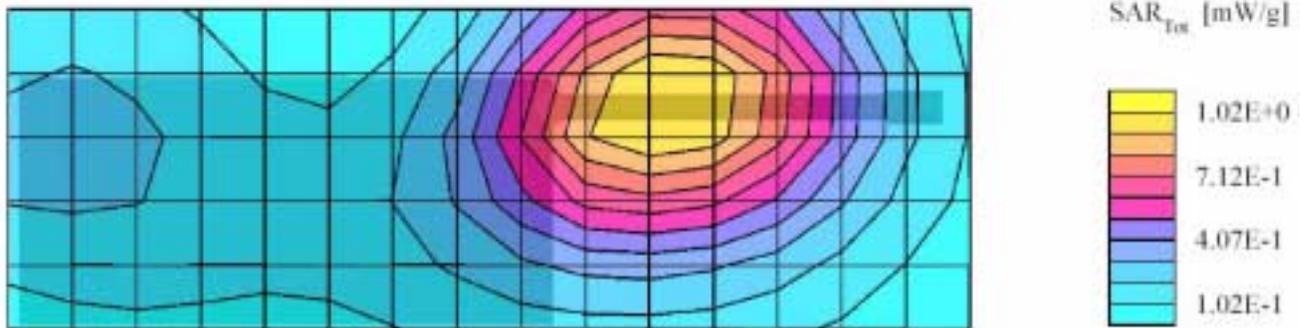
Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 1.1; FCC

Body 915 MHz:  $\rho = 1.06 \text{ mho/m}$   $\mu = 53.0$   $\rho = 1.00 \text{ g/cm}^3$ ; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 1.10 mW/g, SAR (10g): 0.764 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 22.5, 154.5, 4.7

Power drift: 0.31



**FCC ID: AZ489FT5830; Test Date: 2/13/04**

**Motorola CGISS EME Laboratory**

Run #: Ab-R1-040213-04

Model #: H68XAH6RR1AN SN: 364ADY004L

TX Freq: 813.5125 MHZ

Tissue Temp: 20.4 (Celsius)

Start Power: .685 W

Antenna: Fixed

Battery Kit: SNN5706A

Carry Case: None

Audio/Data Acc.: None

**DUT with back towards the phantom with antenna separated 2.5cm**

Flat Phantom; Position: (90°,90°);

Probe: ET3DV6 - SN1384(Cal Date 05-15-2003); ConvF(6.50,6.50,6.50); Probe cal date: 15/05/03; Crest factor: 1.5; FCC

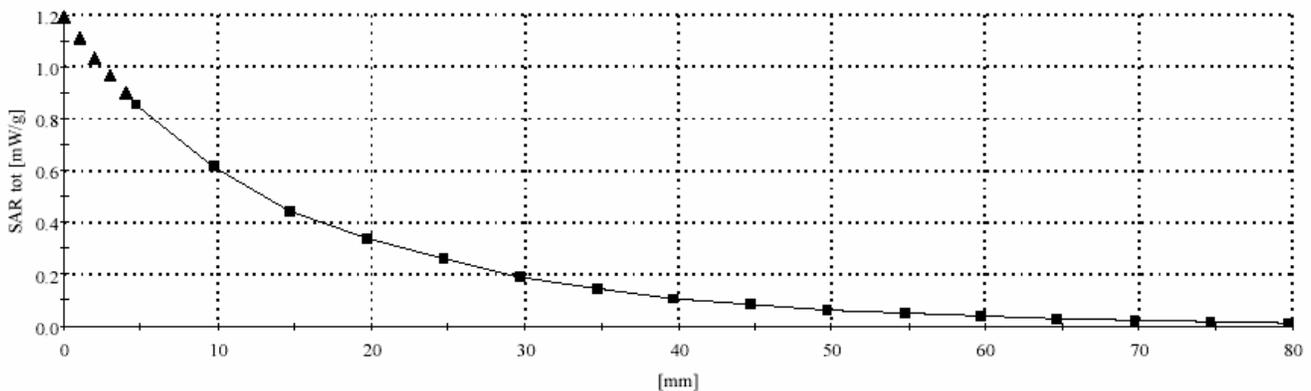
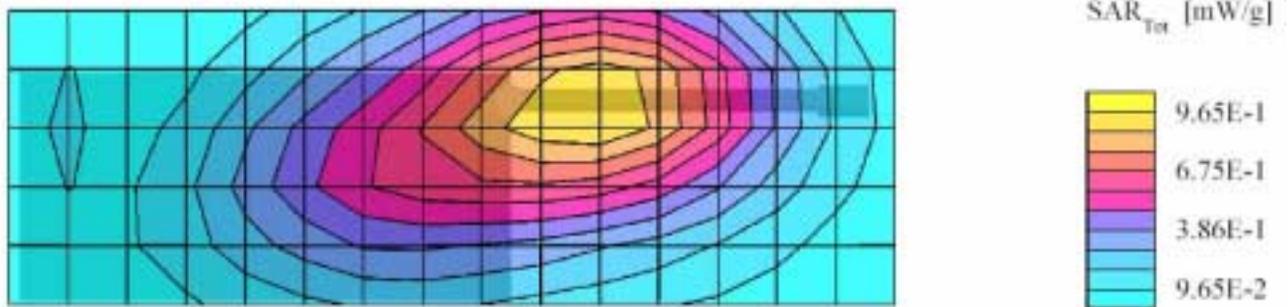
Body 813 MHz:  $\rho = 0.94 \text{ mho/m}$   $\mu = 53.5$   $\rho = 1.00 \text{ g/cm}^3$ ; DAE3: 363V1 DAE Cal Date: 05/13/2003

Cube 7x7x7: SAR (1g): 0.897 mW/g, SAR (10g): 0.634 mW/g \* Max outside, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 25.5, 148.5, 4.7

Power drift: -0.76 dB

Note: "Max outside" has been identified by SPEAG as an unresolved intermittent occurrence with the DASYS 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: 2/8/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040208-01

TX Freq: 900 MHz

Sim Tissue Temp: 21.0 (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 11.78 mW/g (1g avg). Percent from target (including drift) is -1.80 %

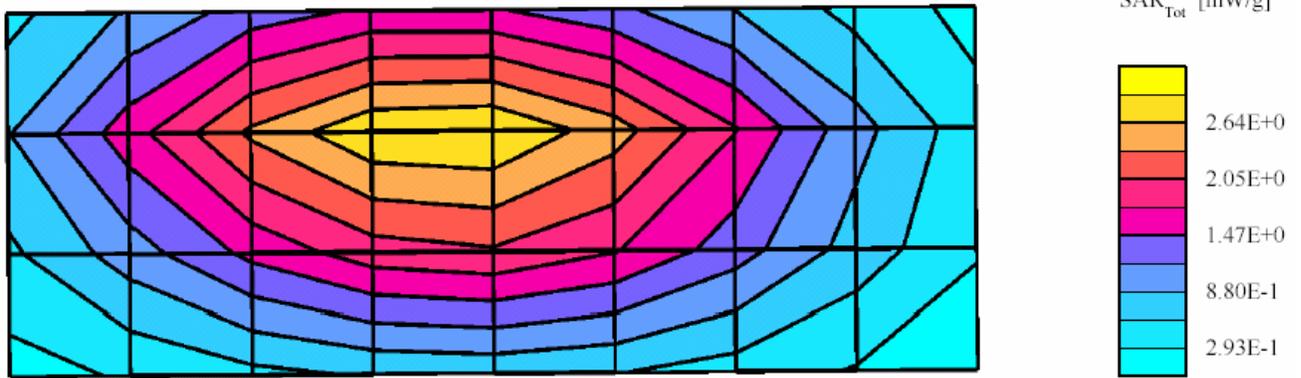
SAR calculated at 1W is 7.35 mW/g (10g avg). Percent from target (including drift) is -2.20 %

SAM; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.60,6.60,6.60); Crest factor: 1.0;

IEEE Head 900 MHz :  $\rho = 0.99 \text{ mho/m}$   $\mu = 40.6$   $\rho = 1.00 \text{ g/cm}^3$ ; DAE3; SN363-V1 DAE Cal Date: 05/13/2003

Cubes (2): Peak: 4.76 mW/g  $\pm 0.00 \text{ dB}$ , SAR (1g): 2.98 mW/g  $\pm 0.00 \text{ dB}$ , SAR (10g): 1.86 mW/g  $\pm 0.00 \text{ dB}$ , (Worst-case extrapolation)Penetration depth: 11.3 (10.5, 12.4) [mm]

Power drift: 0.05 dB



**SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/9/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040209-01

TX Freq: 900 MHz

Sim Tissue Temp: 20.8 (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 12.11 mW/g (1g avg). Percent from target (including drift) is 0.93 %

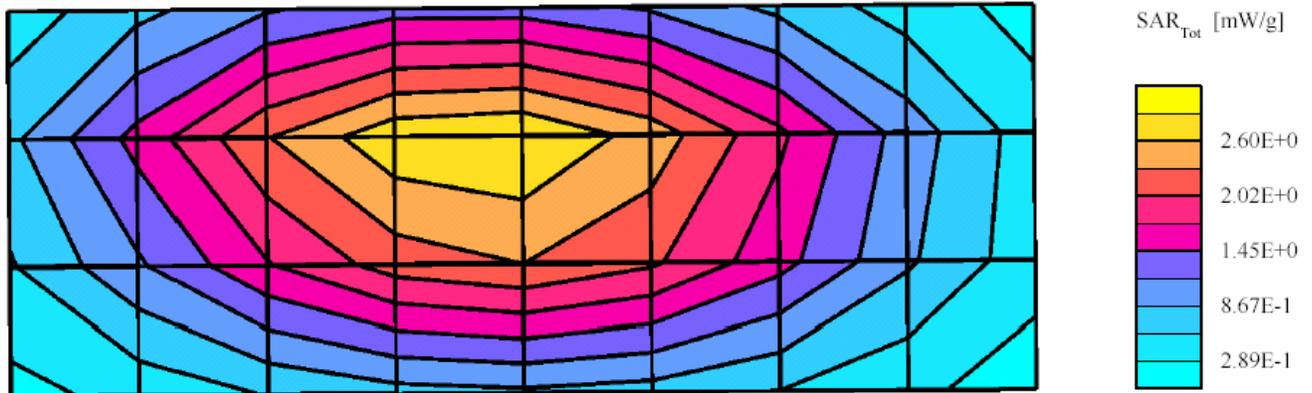
SAR calculated at 1W is 7.57 mW/g (10g avg). Percent from target (including drift) is 0.73 %

SAM; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.60,6.60,6.60); Crest factor: 1.0;

IEEE Head 900 MHz : = 1.01 mho/m = 41.1 = 1.00 g/cm<sup>3</sup>; DAE3; SN363-V1 DAE Cal Date: 05/13/2003

Cubes (2): Peak: 4.92 mW/g ± 0.03 dB, SAR (1g): 3.07 mW/g ± 0.02 dB, SAR (10g): 1.92 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.3 (10.5, 12.4) [mm]

Power drift: 0.06 dB



**SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/10/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040210-01

TX Freq: 900 MHz

Sim Tissue Temp: 20.7 (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)

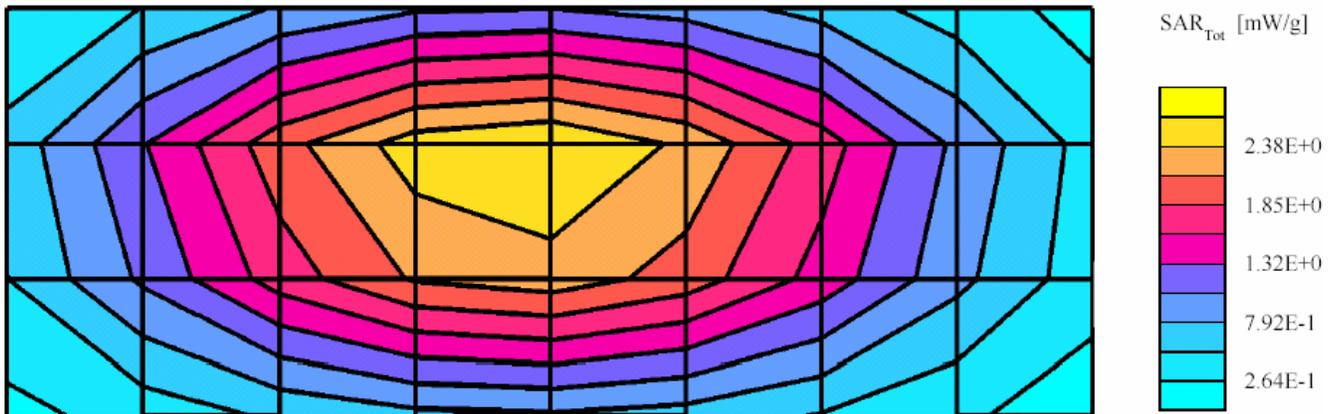
SAR calculated at 1W is 11.28 mW/g (1g avg). Percent from target (including drift) is 0.98 %

SAR calculated at 1W is 7.16 mW/g (10g avg). Percent from target (including drift) is 0.70 %

Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.50,6.50,6.50); Crest factor: 1.0; FCC Body 900 MHz:  $\epsilon = 1.04$  mho/m  $\mu = 52.6$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: SN363-V1 DAE Cal Date: 05/13/2003

Cubes (2): Peak: 4.40 mW/g  $\pm$  0.02 dB, SAR (1g): 2.82 mW/g  $\pm$  0.02 dB, SAR (10g): 1.79 mW/g  $\pm$  0.02 dB, (Worst-case extrapolation)Penetration depth: 12.1 (11.2, 13.4) [mm]

Power drift: 0.00 dB



**SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/11/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040211-01

TX Freq: 900 MHz

Sim Tissue Temp: 20.7 (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 11.12 mW/g (1g avg). Percent from target (including drift) is -0.45 %

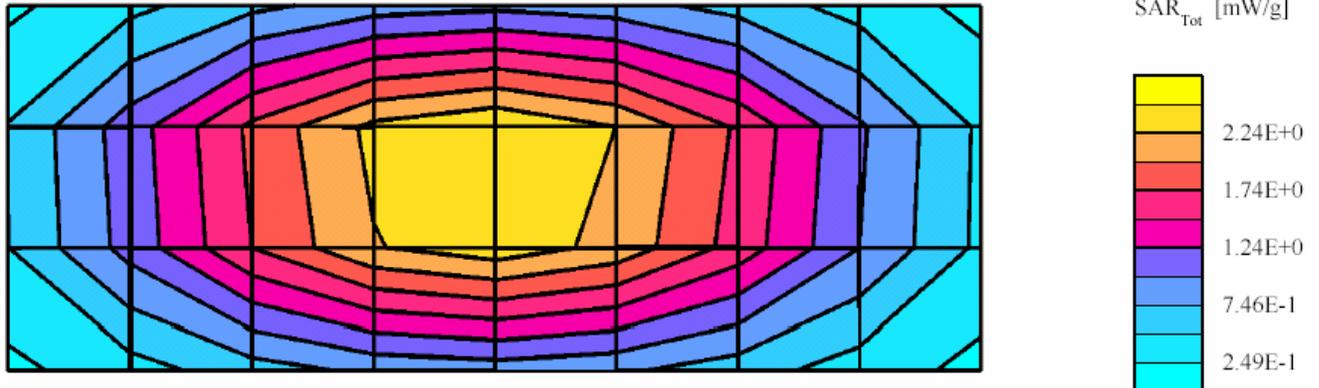
SAR calculated at 1W is 7.08 mW/g (10g avg). Percent from target (including drift) is - 0.42 %

Flat Phantom; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.50,6.50,6.50); Crest factor:

1.0; FCC Body 900 MHz:  $\sigma = 1.03 \text{ mho/m}$   $\epsilon = 52.6$   $\rho = 1.00 \text{ g/cm}^3$ ; DAE3: SN363-V1 DAE Cal Date: 05/13/2003

Cubes (2): Peak: 4.34 mW/g  $\pm$  0.02 dB, SAR (1g): 2.78 mW/g  $\pm$  0.02 dB, SAR (10g): 1.77 mW/g  $\pm$  0.02 dB, (Worst-case extrapolation)Penetration depth: 12.1 (11.2, 13.3) [mm]

Power drift: 0.00 dB



**SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/12/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040212-01

TX Freq: 900 MHz

Sim Tissue Temp: 20.7 (Celsius)

Start Power; 250mW

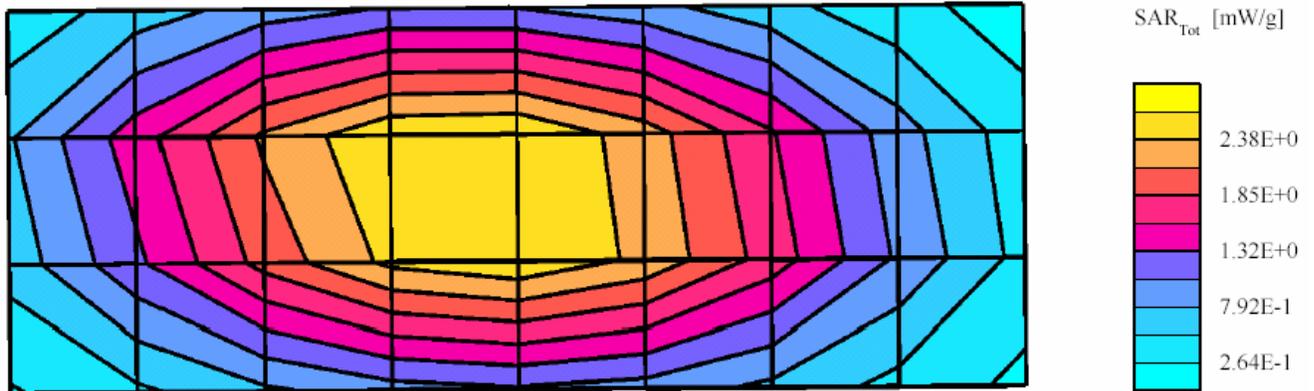
SAR target at 1W is 12.00 mW/g (1g avg, including drift)

SAR target at 1W is 7.52 mW/g (10g avg, including drift)

SAR calculated at 1W is 11.88 mW/g (1g avg). Percent from target (including drift) is -0.97 %

SAR calculated at 1W is 7.43 mW/g (10g avg). Percent from target (including drift) is - 1.24 %

SAM - Expanded; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.60,6.60,6.60); Crest factor: 1.0; IEEE Head 900 MHz :  $\sigma = 1.00 \text{ mho/m}$   $\rho = 40.8$   $\rho = 1.00 \text{ g/cm}^3$ ; DAE3: SN363-V1 DAE Cal Date: 05/13/2003 Cubes (2): Peak: 4.88 mW/g  $\pm 0.03 \text{ dB}$ , SAR (1g): 3.04 mW/g  $\pm 0.02 \text{ dB}$ , SAR (10g): 1.90 mW/g  $\pm 0.02 \text{ dB}$ , (Worst-case extrapolation) Penetration depth: 11.2 (10.4, 12.3) [mm] Power drift: 0.10 dB



**SPEAG 900 MHz Dipole; Model D900V2, SN 085; Test Date: 2/13/04**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R1-040213-01

TX Freq: 900 MHz

Sim Tissue Temp: 20.9 (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 12.06 mW/g (1g avg). Percent from target (including drift) is + 0.47 %

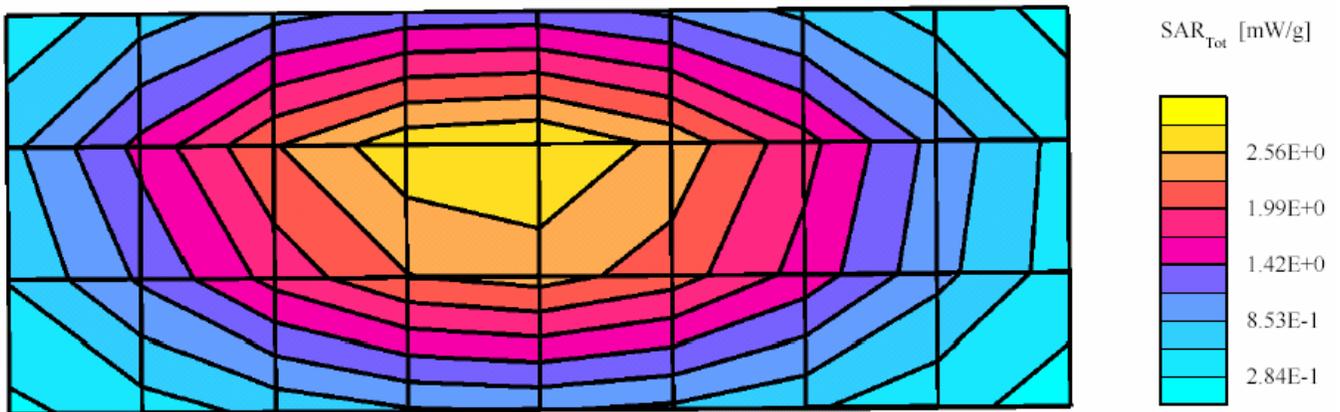
SAR calculated at 1W is 7.54 mW/g (10g avg). Percent from target (including drift) is + 0.26 %

SAM; Probe: ET3DV6 - SN1384(Cal Date 05-15-2003);Probe Cal Date: 15/05/03ConvF(6.60,6.60,6.60); Crest factor: 1.0;

IEEE Head 900 MHz : = 1.00 mho/m = 40.8 = 1.00 g/cm<sup>3</sup>; DAE3: SN363-V1 DAE Cal Date: 05/13/2003

Cubes (2): Peak: 4.92 mW/g ± 0.04 dB, SAR (1g): 3.07 mW/g ± 0.03 dB, SAR (10g): 1.92 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.2 (10.5, 12.3) [mm]

Power drift: 0.08 dB



SYSTEM VALIDATION

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

Tissue Characteristics

|               |             |                  |                               |
|---------------|-------------|------------------|-------------------------------|
| Permittivity: | <u>41.5</u> | Phantom Type/SN: | <u>SAMTP1208</u>              |
| Conductivity: | <u>1.00</u> | Distance (mm):   | <u>15 (tissue/dipole cnt)</u> |

|                   |              |          |
|-------------------|--------------|----------|
| Reference Source: | <u>900V2</u> | (Dipole) |
| Reference SN:     | <u>85</u>    |          |

|                      |            |    |
|----------------------|------------|----|
| Power to Dipole:     | <u>250</u> | mW |
| Power Output (radio) | <u>NA</u>  | mW |

|                       |             |       |            |                 |
|-----------------------|-------------|-------|------------|-----------------|
| Target SAR Value:     | <u>10.8</u> | mW/g, | <u>6.9</u> | mW/g (10g avg.) |
| (normalized to 1.0 W) |             |       |            |                 |

|                     |          |       |             |                 |
|---------------------|----------|-------|-------------|-----------------|
| Measured SAR Value: | <u>3</u> | mW/g, | <u>1.88</u> | mW/g (10g avg.) |
| Power Drift:        | <u>0</u> | dB    |             |                 |

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

|   |              |             |
|---|--------------|-------------|
| Percent Difference From Target (MUST be within System Uncertainty): | <u>11.11</u> | % (1g ave)  |
|   | <u>8.99</u>  | % (10g ave) |

|                    |                         |          |           |
|--------------------|-------------------------|----------|-----------|
| Test performed by: | <u>Edward R. Church</u> | Initial: | <u>EC</u> |
|--------------------|-------------------------|----------|-----------|

## 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 percent from target (including drift) + 10.74 %

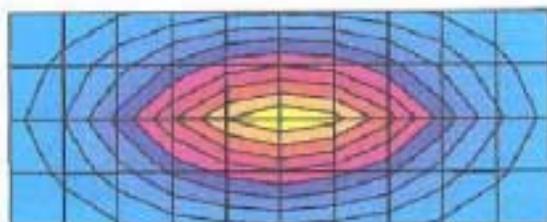
SAR Calculated 10g is 7.52 mW/g Percent from target (including drift) is + 8.99 %

SAM; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(7.00,7.00,7.00), Crest factor: 1.0; IEEE Head 900 MHz.  $\sigma = 1.00$  mho/m  $\epsilon_r = 41.5$   $\rho = 1.00$  g/cm<sup>3</sup>

Cubes (2): Peak: 4.78 mW/g  $\pm 0.04$  dB, SAR (1g): 3.00 mW/g  $\pm 0.04$  dB, SAR (10g): 1.88 mW/g  $\pm 0.05$  dB, (Worst-case extrapolation)

Penetration depth: 11.2 (10.5, 12.3) [mm]

Powerdrift: 0.00 dB



SAR<sub>Tot</sub> [mW/g]



3.00E-1

**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

Permittivity: 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: 11.17 mW/g, 7.11 mW/g (10g avg.)  
(normalized to 1.0 W, including drift)

Test performed by: Edward R. Church Initial: ERC

# 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 #: 30302002A-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 percent from target (including drift) 0 %

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

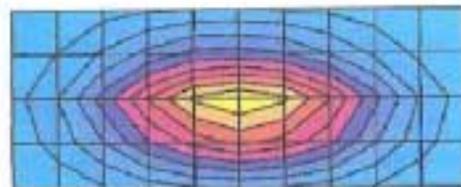
Flat; Probe: ET3DV6 - SN1393 (Cal Date 16 April 2003) ; ConvF(6.80,6.80,6.80); Crest factor: 1.0; FCC

Body 900MHz:  $\sigma = 1.03$  mho/m  $\epsilon_r = 52.6$   $\rho = 1.00$  g/cm<sup>3</sup>

Cubes (2): Peak: 4.34 mW/g  $\pm 0.03$  dB, SAR (1g): 2.78 mW/g  $\pm 0.03$  dB, SAR (10g): 1.77 mW/g  $\pm 0.03$  dB, (Worst-case extrapolation)

Penetration depth: 12.1 (11.2, 13.3) [mm]

Powerdrift: -0.02 dB



SAR<sub>Tot</sub> [mW/g]



**APPENDIX D**  
**Calibration Certificates**

Client **Motorola CGISS**

| CALIBRATION CERTIFICATE   |   |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
|---|---|---|--|------------|------|---|-----------------------|-----------------------|--------------|---|------------------------|---------------------|------------|-------------------------------|--------|-----------------------|------------|-----------------------------------|--------|------------------------|------------|-------------------------------|--------|---------------------------|------------|-------------------------------------|------------------------|-----------------------------------|-------------|---------------------------|--------|
| Object(s)   | ET3DV6 - SN.1384  |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Calibration procedure(s)  | QA CAL-01.v2<br>Calibration procedure for dosimetric E-field probes |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Calibration date:   | May 15, 2003  |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Condition of the calibrated item  | In Tolerance (according to the specific calibration document)       |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| <p>This calibration statement documents traceability of M&amp;TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.</p> <p>All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity &lt; 75%.</p> <p>Calibration Equipment used (M&amp;TE critical for calibration)</p> <table border="1"> <thead> <tr> <th>Model/Type</th> <th>ID #</th> <th>Cal Date (Calibrated by, Certificate No.)</th> <th>Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>RF generator HP 8664C</td> <td>US3642U01700</td> <td>4-Aug-99 (SPEAG, in house check Aug-02)</td> <td>In house check: Aug-05</td> </tr> <tr> <td>Power sensor E4412A</td> <td>MY41485277</td> <td>2-Apr-03 (METAS, No 252-6250)</td> <td>Apr-04</td> </tr> <tr> <td>Power sensor HP 8481A</td> <td>MY41092180</td> <td>18-Sep-02 (Agilent, No. 20020918)</td> <td>Sep-03</td> </tr> <tr> <td>Power meter EPM E4419B</td> <td>GB41293874</td> <td>2-Apr-03 (METAS, No 252-6250)</td> <td>Apr-04</td> </tr> <tr> <td>Network Analyzer HP 8753E</td> <td>US36432426</td> <td>3-May-03 (Agilent, No. 6702K064002)</td> <td>In house check: May 03</td> </tr> <tr> <td>Fluke Process Calibrator Type 702</td> <td>SN: 6295803</td> <td>3-Sep-01 (ELCAL, No.2360)</td> <td>Sep-03</td> </tr> </tbody> </table> |   |   |  | Model/Type | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration | RF generator HP 8664C | US3642U01700 | 4-Aug-99 (SPEAG, in house check Aug-02) | In house check: Aug-05 | Power sensor E4412A | MY41485277 | 2-Apr-03 (METAS, No 252-6250) | Apr-04 | Power sensor HP 8481A | MY41092180 | 18-Sep-02 (Agilent, No. 20020918) | Sep-03 | Power meter EPM E4419B | GB41293874 | 2-Apr-03 (METAS, No 252-6250) | Apr-04 | Network Analyzer HP 8753E | US36432426 | 3-May-03 (Agilent, No. 6702K064002) | In house check: May 03 | Fluke Process Calibrator Type 702 | SN: 6295803 | 3-Sep-01 (ELCAL, No.2360) | Sep-03 |
| Model/Type  | ID #  | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| RF generator HP 8664C   | US3642U01700  | 4-Aug-99 (SPEAG, in house check Aug-02)   | In house check: Aug-05   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Power sensor E4412A   | MY41485277  | 2-Apr-03 (METAS, No 252-6250)             | Apr-04   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Power sensor HP 8481A   | MY41092180  | 18-Sep-02 (Agilent, No. 20020918)         | Sep-03   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Power meter EPM E4419B  | GB41293874  | 2-Apr-03 (METAS, No 252-6250)             | Apr-04   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Network Analyzer HP 8753E   | US36432426  | 3-May-03 (Agilent, No. 6702K064002)       | In house check: May 03   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Fluke Process Calibrator Type 702   | SN: 6295803   | 3-Sep-01 (ELCAL, No.2360)                 | Sep-03   |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Calibrated by:  | Name<br>Nicolas Vidian  | Function<br>Technician                    | Signature<br> |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Approved by:  | Name<br>Kerja Porcato   | Function<br>Laboratory Director           | Signature<br> |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| Date issued: May 15, 2003   |   |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |
| <p>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 &amp; Partner Engineering AG is completed.</p>   |   |   |  |            |      |   |                       |                       |              |   |                        |                     |            |                               |        |                       |            |                                   |        |                        |            |                               |        |                           |            |                                     |                        |                                   |             |                           |        |

**DASY - Parameters of Probe: ET3DV6 SN:1384****Sensitivity in Free Space**

|       |  |
|-------|--|
| NormX | 1.76 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormY | 1.72 $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormZ | 1.89 $\mu\text{V}/(\text{V}/\text{m})^2$ |

**Diode Compression**

|       |    |    |
|-------|----|----|
| DCP X | 92 | mV |
| DCP Y | 92 | mV |
| DCP Z | 92 | mV |

**Sensitivity in Tissue Simulating Liquid**

Head                      900 MHz                       $\epsilon_r = 41.5 \pm 5\%$                        $\sigma = 0.97 \pm 5\%$  mho/m

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

|         |                       |                   |
|---------|-----------------------|-------------------|
| ConvF X | 6.6 $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | 6.6 $\pm 9.5\%$ (k=2) | Alpha <b>0.45</b> |
| ConvF Z | 6.6 $\pm 9.5\%$ (k=2) | Depth <b>2.42</b> |

Head                      1800 MHz                       $\epsilon_r = 40.0 \pm 5\%$                        $\sigma = 1.40 \pm 5\%$  mho/m

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

|         |                       |                   |
|---------|-----------------------|-------------------|
| ConvF X | 5.4 $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | 5.4 $\pm 9.5\%$ (k=2) | Alpha <b>0.55</b> |
| ConvF Z | 5.4 $\pm 9.5\%$ (k=2) | Depth <b>2.56</b> |

**Boundary Effect**

Head                      900 MHz                      Typical SAR gradient: 5 % per mm

|                       |                              |      |      |
|-----------------------|------------------------------|------|------|
| Probe Tip to Boundary |                              | 1 mm | 2 mm |
| SAR <sub>be</sub> [%] | Without Correction Algorithm | 11.4 | 6.3  |
| SAR <sub>be</sub> [%] | With Correction Algorithm    | 0.4  | 0.7  |

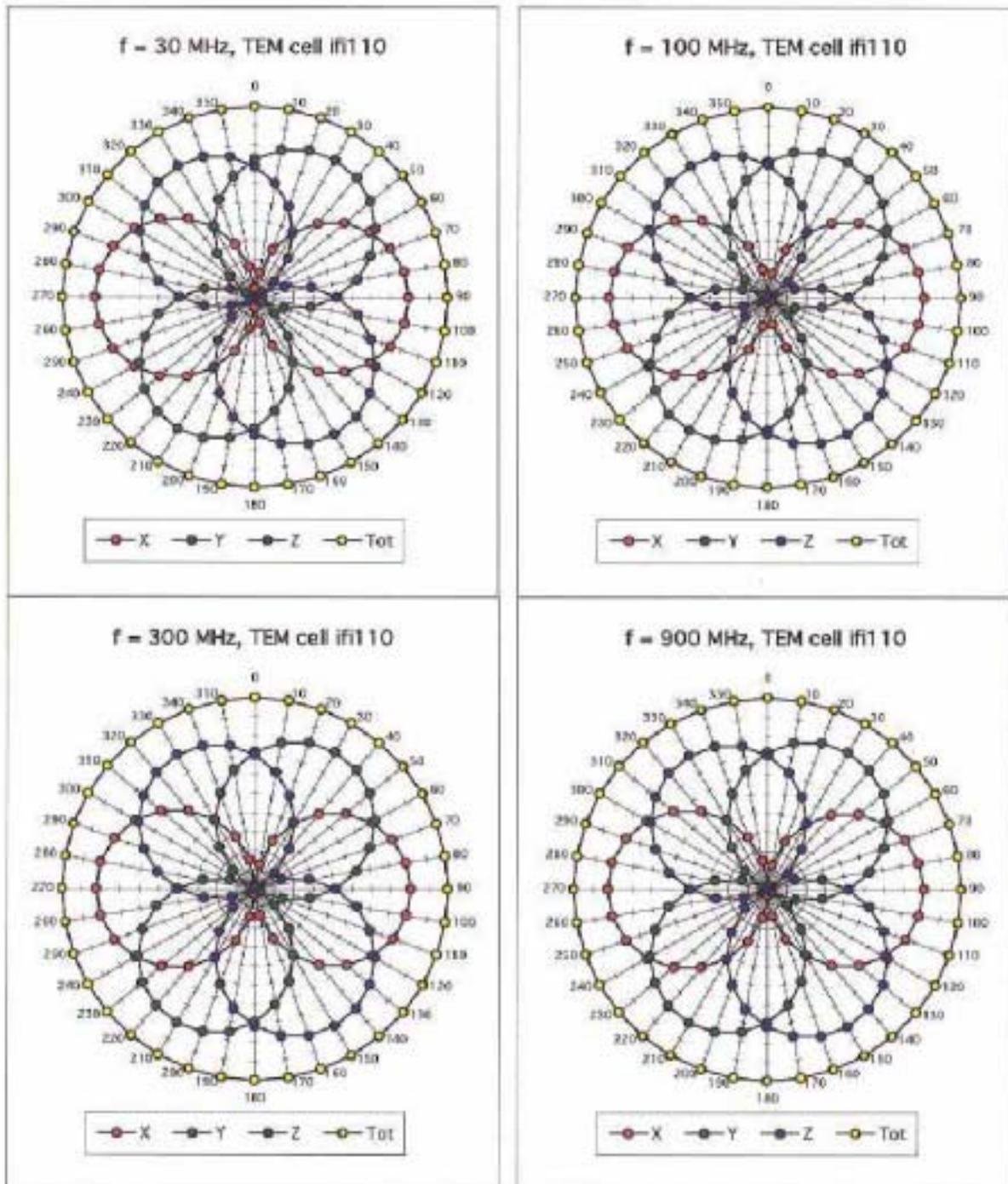
Head                      1800 MHz                      Typical SAR gradient: 10 % per mm

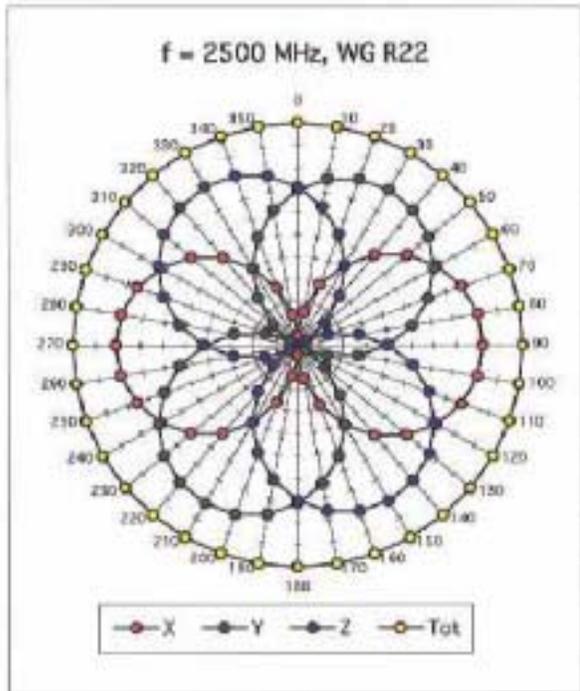
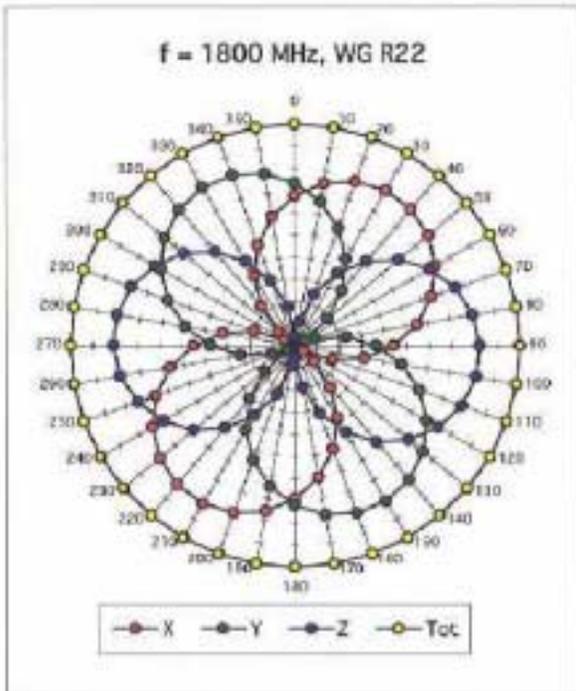
|                       |                              |      |      |
|-----------------------|------------------------------|------|------|
| Probe Tip to Boundary |                              | 1 mm | 2 mm |
| SAR <sub>be</sub> [%] | Without Correction Algorithm | 14.7 | 9.5  |
| SAR <sub>be</sub> [%] | With Correction Algorithm    | 0.1  | 0.0  |

**Sensor Offset**

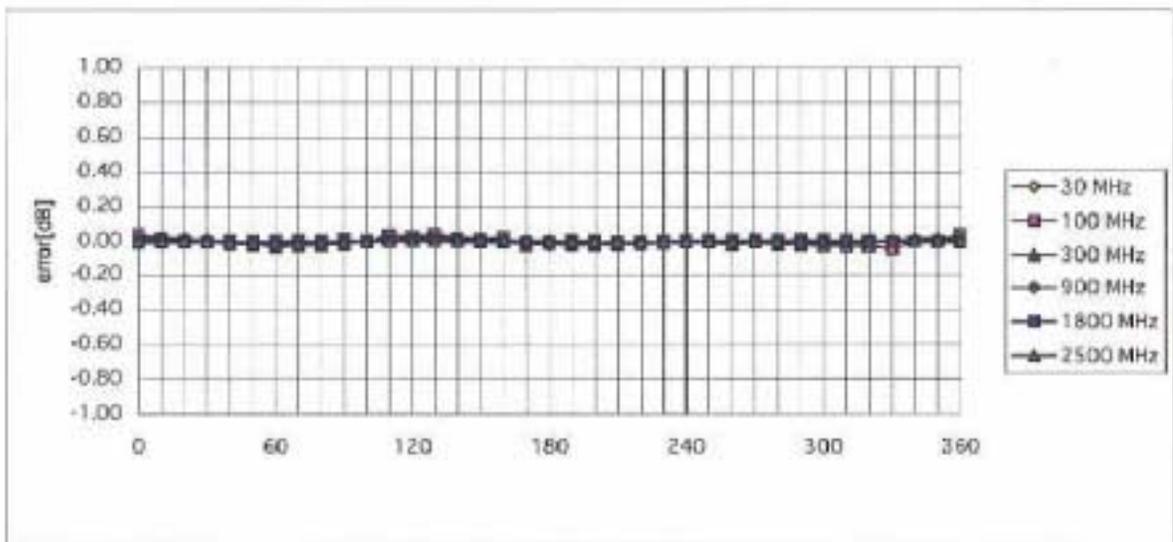
|                            |               |    |
|----------------------------|---------------|----|
| Probe Tip to Sensor Center | 2.7           | mm |
| Optical Surface Detection  | 1.5 $\pm 0.2$ | mm |

### Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$



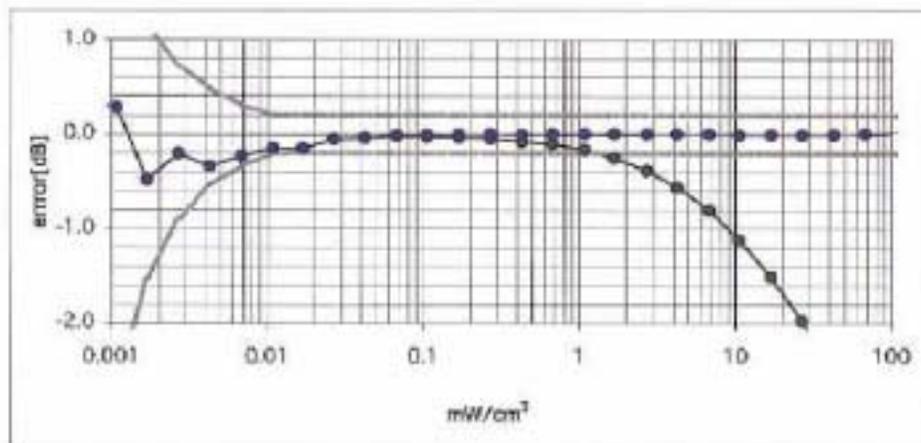
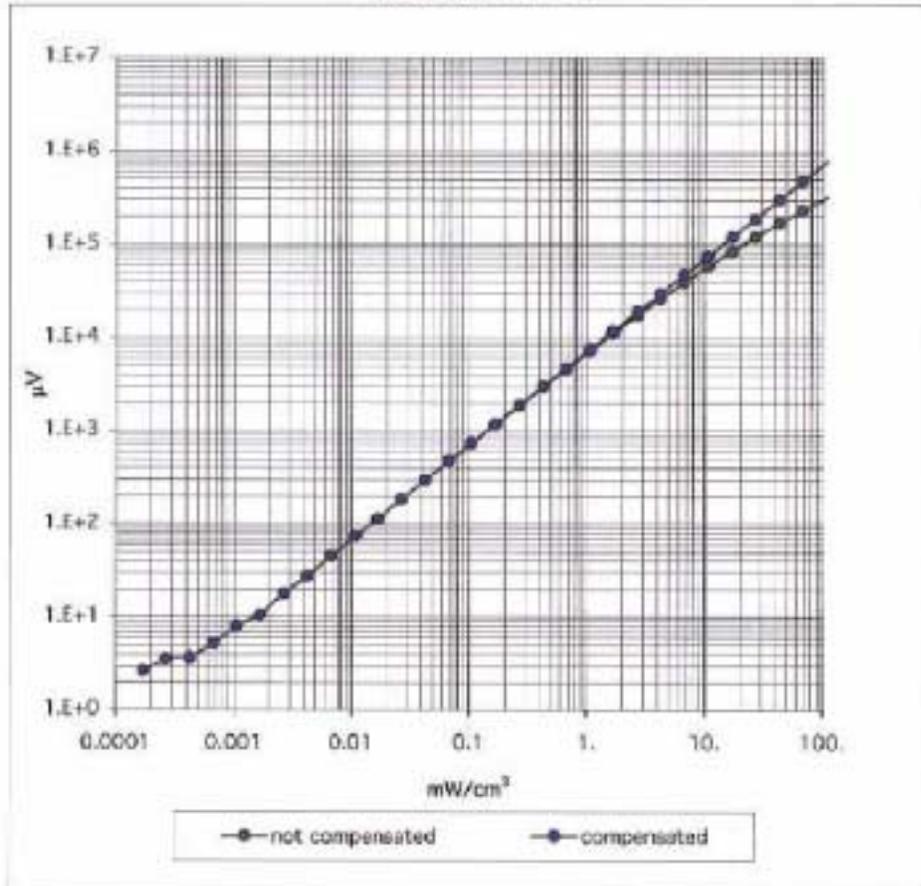


**Isotropy Error ( $\phi$ ),  $\theta = 0^\circ$**



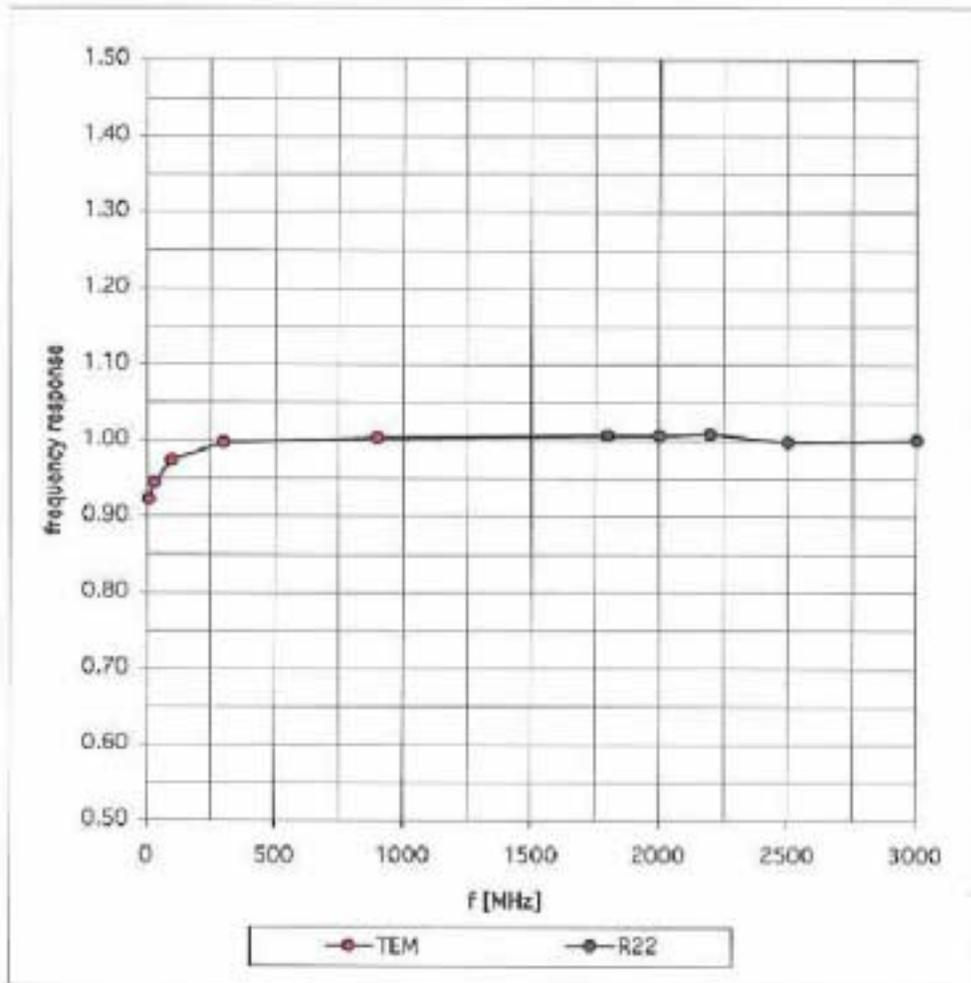
### Dynamic Range $f(\text{SAR}_{\text{brain}})$

( Waveguide R22 )



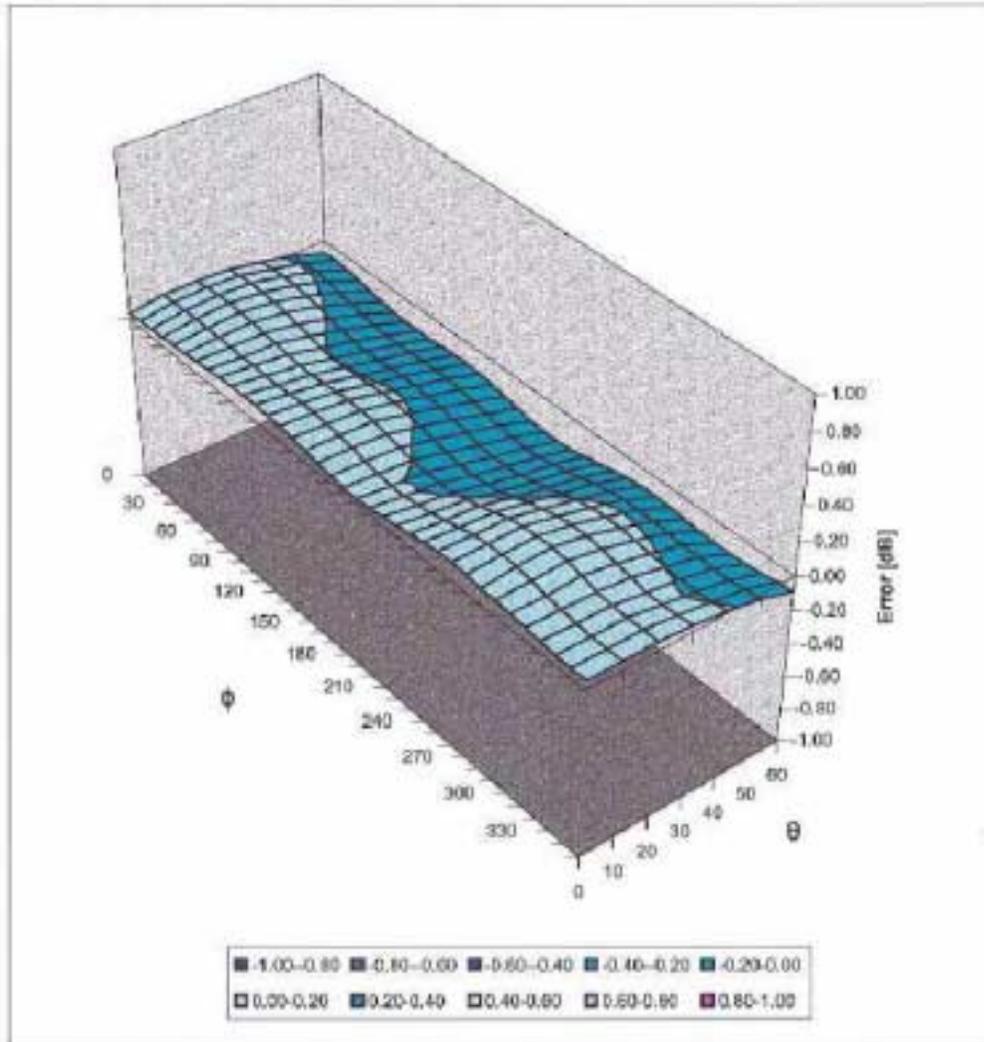
### Frequency Response of E-Field

( TEM-Cell:ifi110, Waveguide R22)



### Deviation from Isotropy in HSL

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



## Additional Conversion Factors

for Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1384

Place of Assessment:

Zurich

Date of Assessment:

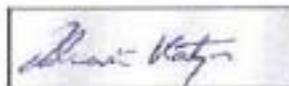
May 19, 2003

Probe Calibration Date:

May 15, 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:1384

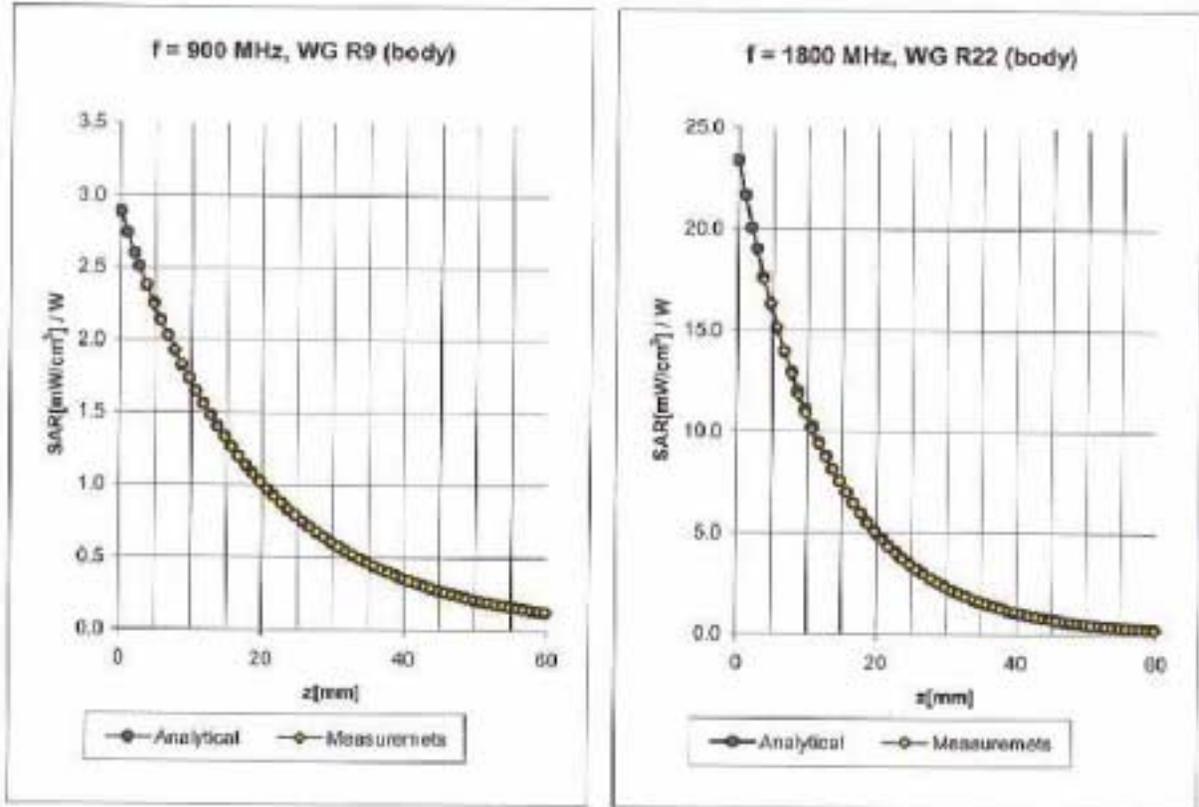
Conversion factor ( $\pm$  standard deviation)

|          |       |              |   |
|----------|-------|--------------|---|
| 150 MHz  | ConvF | 8.2 $\pm$ 8% | $\epsilon_r = 61.9$<br>$\sigma = 0.80$ mho/m<br>(body tissue) |
| 236 MHz  | ConvF | 8.1 $\pm$ 8% | $\epsilon_r = 59.8$<br>$\sigma = 0.87$ mho/m<br>(body tissue) |
| 300 MHz  | ConvF | 7.9 $\pm$ 8% | $\epsilon_r = 58.2$<br>$\sigma = 0.92$ mho/m<br>(body tissue) |
| 350 MHz  | ConvF | 7.9 $\pm$ 8% | $\epsilon_r = 57.7$<br>$\sigma = 0.93$ mho/m<br>(body tissue) |
| 450 MHz  | ConvF | 7.6 $\pm$ 8% | $\epsilon_r = 56.7$<br>$\sigma = 0.94$ mho/m<br>(body tissue) |
| 784 MHz  | ConvF | 6.6 $\pm$ 8% | $\epsilon_r = 55.4$<br>$\sigma = 0.97$ mho/m<br>(body tissue) |
| 1450 MHz | ConvF | 5.5 $\pm$ 8% | $\epsilon_r = 54.0$<br>$\sigma = 1.30$ mho/m<br>(body tissue) |

**Dosimetric E-Field Probe ET3DV6 SN:1384**Conversion factor ( $\pm$  standard deviation)

|         |       |              |   |
|---------|-------|--------------|---|
| 150 MHz | ConvF | 9.1 $\pm$ 8% | $\epsilon_r = 52.3$<br>$\sigma = 0.76$ mho/m<br>(head tissue)           |
| 236 MHz | ConvF | 8.3 $\pm$ 8% | $\epsilon_r = 48.3$<br>$\sigma = 0.82$ mho/m<br>(head tissue)           |
| 300 MHz | ConvF | 7.8 $\pm$ 8% | $\epsilon_r = 45.3$<br>$\sigma = 0.87$ mho/m<br>(head tissue)           |
| 350 MHz | ConvF | 7.8 $\pm$ 8% | $\epsilon_r = 44.7$<br>$\sigma = 0.87$ mho/m<br>(head tissue)           |
| 400 MHz | ConvF | 7.5 $\pm$ 8% | $\epsilon_r = 44.4$<br>$\sigma = 0.87$ mho/m<br>(head tissue - CENELEC) |
| 450 MHz | ConvF | 7.5 $\pm$ 8% | $\epsilon_r = 43.5$<br>$\sigma = 0.87$ mho/m<br>(head tissue)           |
| 784 MHz | ConvF | 6.8 $\pm$ 8% | $\epsilon_r = 41.8$<br>$\sigma = 0.90$ mho/m<br>(head tissue)           |

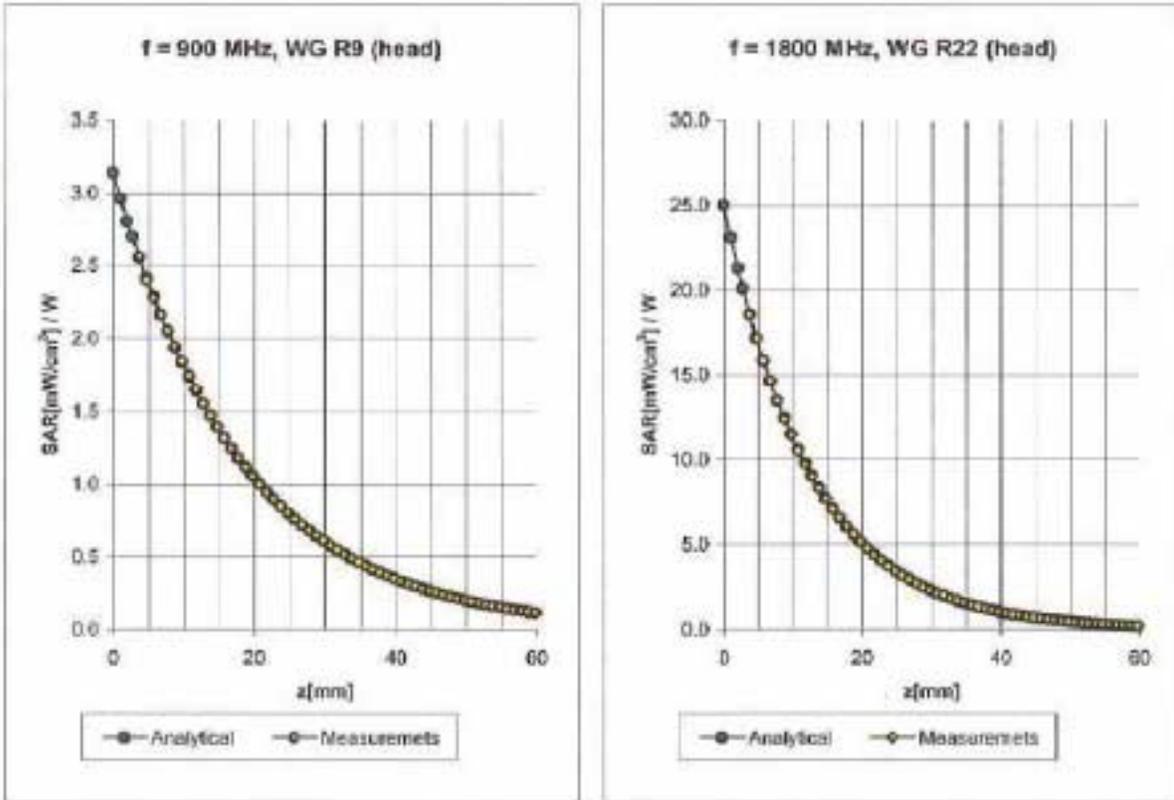
### Conversion Factor Assessment



|  |                       |                             |                               |
|--|-----------------------|-----------------------------|-------------------------------|
| Body   | 900 MHz               | $\epsilon_r = 55.0 \pm 5\%$ | $\sigma = 1.05 \pm 5\%$ mho/m |
| Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to CET 65 Suppl. C |                       |                             |                               |
| ConvF X  | $6.5 \pm 9.5\%$ (k=2) | Boundary effect:            |                               |
| ConvF Y  | $6.5 \pm 9.5\%$ (k=2) | Alpha                       | <b>0.44</b>                   |
| ConvF Z  | $6.5 \pm 9.5\%$ (k=2) | Depth                       | <b>2.51</b>                   |

|   |                       |                             |                               |
|---|-----------------------|-----------------------------|-------------------------------|
| Body  | 1800 MHz              | $\epsilon_r = 53.3 \pm 5\%$ | $\sigma = 1.52 \pm 5\%$ mho/m |
| Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to CET 65 Suppl. C |                       |                             |                               |
| ConvF X   | $5.0 \pm 9.5\%$ (k=2) | Boundary effect:            |                               |
| ConvF Y   | $5.0 \pm 9.5\%$ (k=2) | Alpha                       | <b>0.64</b>                   |
| ConvF Z   | $5.0 \pm 9.5\%$ (k=2) | Depth                       | <b>2.49</b>                   |

### Conversion Factor Assessment



Head                      900 MHz                       $\epsilon_r = 41.5 \pm 5\%$                        $\sigma = 0.97 \pm 5\%$  mho/m

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

|         |                  |                  |             |
|---------|------------------|------------------|-------------|
| ConvF X | 6.6 ± 9.5% (k=2) | Boundary effect: |             |
| ConvF Y | 6.6 ± 9.5% (k=2) | Alpha            | <b>0.45</b> |
| ConvF Z | 6.6 ± 9.5% (k=2) | Depth            | <b>2.42</b> |

Head                      1800 MHz                       $\epsilon_r = 40.0 \pm 5\%$                        $\sigma = 1.40 \pm 5\%$  mho/m

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

|         |                  |                  |             |
|---------|------------------|------------------|-------------|
| ConvF X | 5.4 ± 9.5% (k=2) | Boundary effect: |             |
| ConvF Y | 5.4 ± 9.5% (k=2) | Alpha            | <b>0.55</b> |
| ConvF Z | 5.4 ± 9.5% (k=2) | Depth            | <b>2.56</b> |

# Schmid & Partner Engineering AG

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

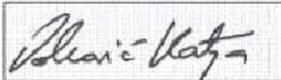
## Calibration Certificate

### 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: |  |
| Approved by:   |  |

## 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 <sup>3</sup> (1 g) of tissue:   | 11.0 mW/g |
| averaged over 10 cm <sup>3</sup> (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:

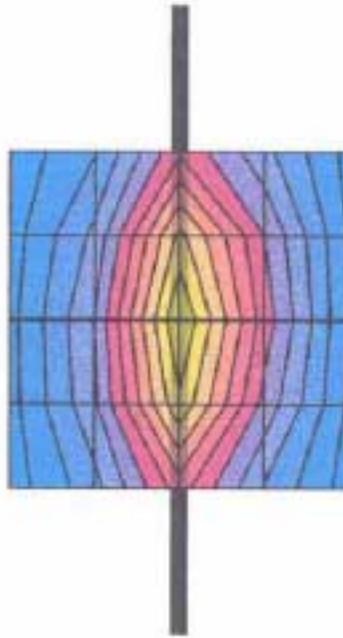
|  |           |
|--|-----------|
| averaged over 1 cm <sup>3</sup> (1 g) of tissue:   | 10.3 mW/g |
| averaged over 10 cm <sup>3</sup> (10 g) of tissue: | 6.64 mW/g |



08/27/02

### Validation Dipole D900V2 SN:085, d=15 mm

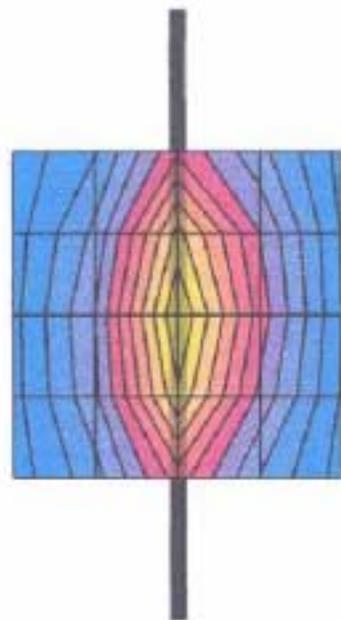
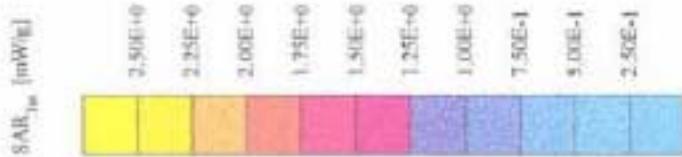
Frequency: 900 MHz, Antenna Input Power: 250 [mW]  
SAA: Pflanzers, Flat Sections, Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Probe: ET1DV6 - SN1507, ConvF(6,50,6,50) at 900 MHz, IEEE 1528 900 MHz,  $\alpha = 0.97$  mho/m,  $\epsilon_r = 41.7$  p = 1.00 g/cm<sup>3</sup>  
Cubes (2): Peak: 4.34 mW/g  $\pm$  0.01 dB, SAR (1g): 2.34 mW/g  $\pm$  0.01 dB, SAR (10g): 1.73 mW/g  $\pm$  0.02 dB. (Worst-case extrapolation)  
Penetration depth: 11.6 (10.8, 12.8) [mm]  
Powerdritf: -0.00 dB



Schmid & Partner Engineering AG, Zurich, Switzerland

### Validation Dipole D900V2 SN:085, d=1.5 mm

Frequency: 900 MHz; Antenna Input Power: 250 [mW]  
S-AM Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0  
Probe: ET3DV6 - SN1507, ConnF(6.50,6.50,6.50) at 900 MHz, IEEE 1528 900 MHz;  $\sigma = 0.97$  mS/m,  $\epsilon = 41.7$  p - 1.00  $\mu$ cm<sup>2</sup>  
Cubica (2) Peak: 3.85 mW/g  $\pm$  0.01 dB, SAR<sub>(1g)</sub>: 2.57 mW/g  $\pm$  0.01 dB, SAR<sub>(10g)</sub>: 1.66 mW/g  $\pm$  0.02 dB, (Advanced extrapolation)  
Penetration depth: 12.6 (12.4, 12.9) [mm]  
Powerdntfl: -0.00 dB



**APPENDIX E**  
**Illustration of Body-Worn Accessories**

The purpose of this appendix is to illustrate the body-worn carry accessory for FCC ID: AZ489FT5830. The sample that was used in the following photos represents the product used to obtain the results presented herein.



**Photo 1.**  
**Model NNTN5210A**  
**Back View**



**Photo 2.**  
**Model NNTN5210A**  
**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:

| <b>Carry Case Models</b> | <b>Tested ?</b> | <b>Separation distances between DUT antenna and phantom surface. (mm)</b> | <b>Comments</b> |
|--------------------------|-----------------|---|-----------------|
| NNTN5210A                | Yes             | 34-35   | NA              |

| <b>Audio Acc. Models</b> | <b>Tested ?</b> | <b>Separation distances between DUT antenna and phantom surface. (mm)</b> | <b>Comments</b> |
|--------------------------|-----------------|---|-----------------|
| 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              |
| NNTN5208A                | Yes             | NA  | NA              |
| NNTN5004A                | Yes             | NA  | NA              |
| NNTN5005A                | Yes             | NA  | NA              |

| <b>Data cables Models</b> | <b>Tested ?</b> | <b>Separation distances between DUT antenna and phantom surface. (mm)</b> | <b>Comments</b> |
|---------------------------|-----------------|---|-----------------|
| NKN6560A                  | Yes             | NA  | NA              |
| NKN6559A                  | Yes             | NA  | NA              |