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

Attention:	FCC
Date of Report:	April 7, 2003
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	1:6, 2:6, 81:120 TDM; 64 QAM, 16 QAM & QPSK Modulation; 0.6 W Pulse average
FCC ID:	**AZ489FT5808**
Device Model:	H59UAH6RR5AN

Test Period:	3/13/03 – 3/27/03
EME Tech:	Clint Miller
EME Eng.:	Kim Uong (Lead 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.

Signature on File — 4/7/03

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

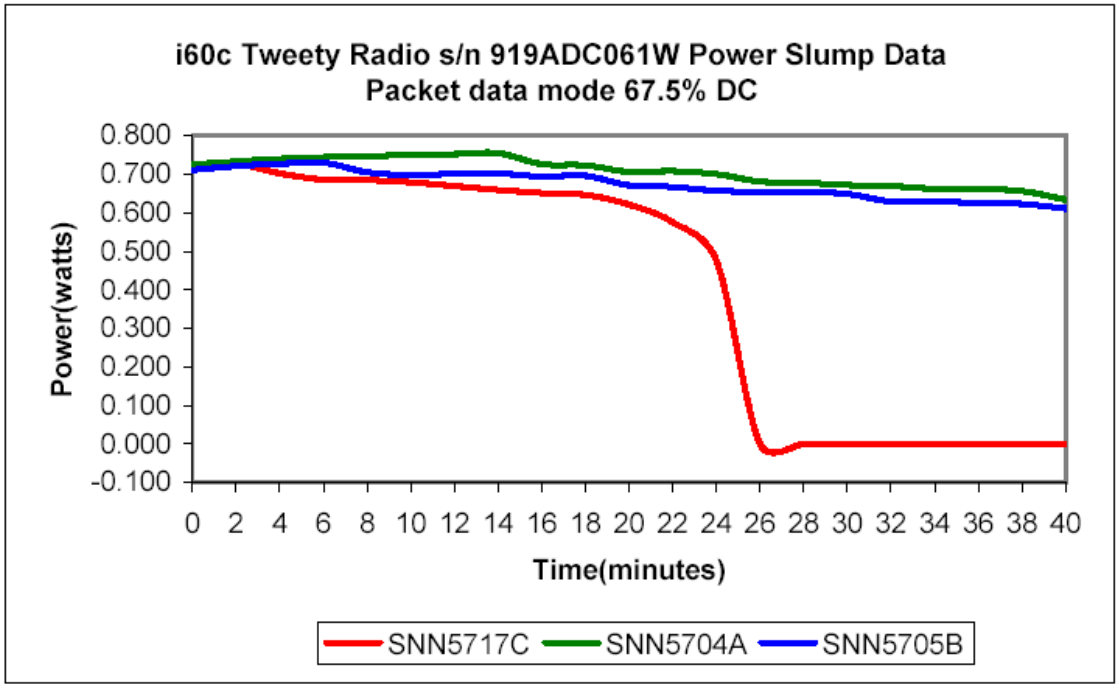
Date Approved

APPENDIX A

Power Slump Data/Shortened Scan

DUT Power versus time data

Radio S/N	919ADC061W	919ADC061W	919ADC061W
Battery	SNN5717C	SNN5704A	SNN5705B
Time(Minutes)	Power(watts)	Power(watts)	Power(watts)
0	0.720	0.725	0.711
2	0.727	0.733	0.721
4	0.702	0.740	0.727
6	0.686	0.744	0.730
8	0.685	0.747	0.705
10	0.679	0.750	0.698
12	0.669	0.752	0.701
14	0.659	0.755	0.702
16	0.651	0.726	0.694
18	0.646	0.723	0.696
20	0.621	0.706	0.671
22	0.575	0.708	0.667
24	0.475	0.700	0.657
26	0.000	0.681	0.654
28	0.000	0.678	0.653
30	0.000	0.672	0.649
32	0.000	0.669	0.629
34	0.000	0.662	0.631
36	0.000	0.661	0.624
38	0.000	0.656	0.623
40	0.000	0.634	0.611



Shortened Scan Results

FCC ID: AZ489FT5808; Test Date: 3/27/03
Motorola CGISS EME Laboratory
Run #: R2-030327-08-KU
Model #: H59UAH6RR5AN; SN: 919ADDC061W
SIM TEMP: 21.7 C
TX Freq: 813.5 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NNTN4126A
Audio/data accessories: NONE

Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.
Representative "normal" scan run time was 24 minutes
"Shortened" scan max calculated S.A.R. using end power: 1-g Avg. = 1.03 mW/g; 10-g Avg. = 0.71mW/g
"Normal" scan max calculated S.A.R. using end power: 1-g Avg. = 1.14 mW/g; 10-g Avg. = 0.80mW/g
(see section 7.1 run # R2-030313-05-KU)

DUT w/ carry case against the flat phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 1.5; FCC Body 813: σ = 0.96 mho/m ε = 53.1 ρ = 1.00 g/cm3; DAE3V1SN401 Cal date: (8/26/02)
Cube 5x5x7: SAR (1g): 0.953 mW/g, SAR (10g): 0.657 mW/g * Max outside, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0;

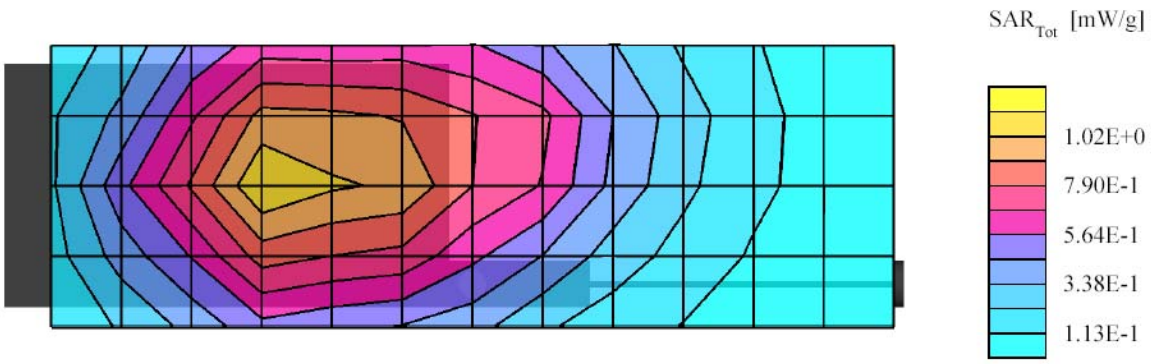
Note: "Max outside" has been identified by SPEAG as an unresolved intermittent occurrence with the DASY 3 application even when the entire peak area is captured.

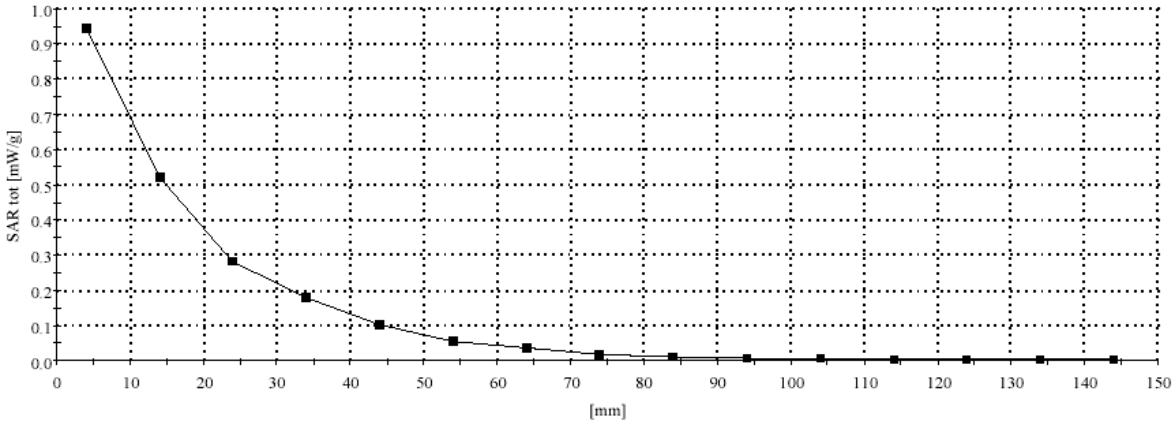
APPENDIX B
Data Results

FCC ID: AZ489FT5808; Test Date: 3/21/03
Motorola CGISS EME Laboratory
RUN #: R2-030321-12-CM
Model #: H59UAH6RR5AN S/N:919ADC0643
Simulated tissue temp: 21.3
Tx freq: 813.5125

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: RLN5334B
Audio/data accessories: None

DUT w/ carry case against phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 1.5; FCC Body 813: σ = 0.97 mho/m ε = 54.3 ρ = 1.00 g/cm3; DAE3V1SN401 Cal date (8/26/02)
Cube 7x7x7: SAR (1g): 0.977 mW/g, SAR (10g): 0.662 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 28.5, 48.0, 4.0
Power Drift: -0.13 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.

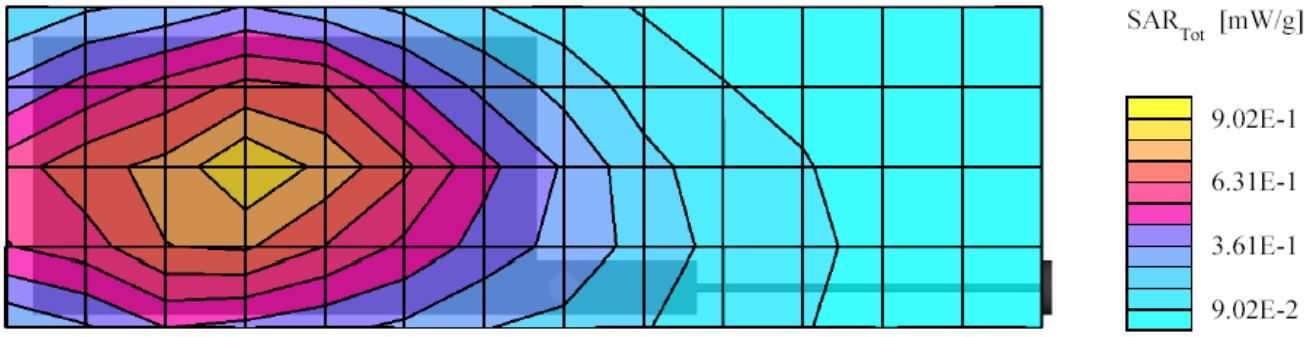


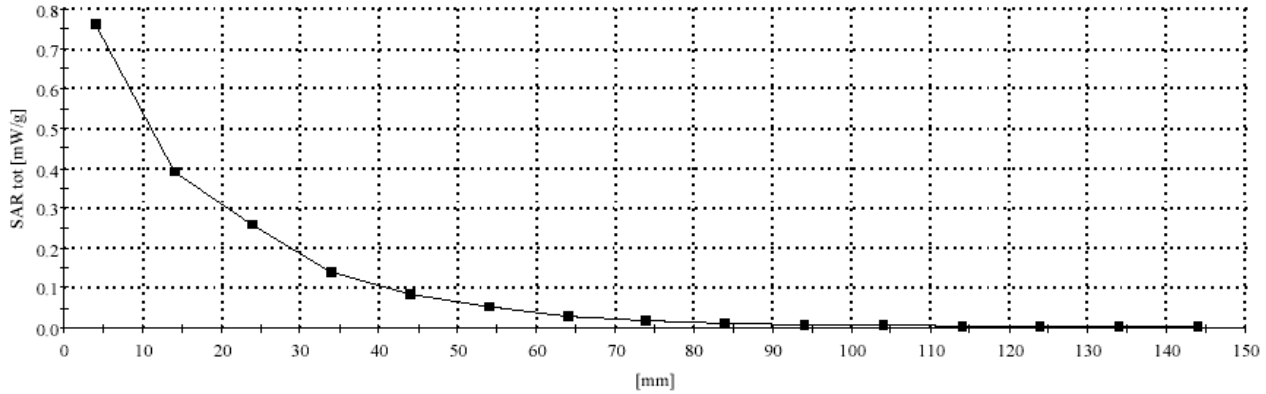


FCC ID: AZ489FT5808; Test Date: 3/19/03
Motorola CGISS EME Laboratory
Run #: R2-030319-04-CM
Model #: H59UAH6RR5AN S/N: 919ADC061W
Simulated tissue temp: 21.1C
Tx freq: 813.5125 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NNTN4126A
Audio/data accessories: NKN6540A

DUT w/ carry case against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 1.5; FCC Body 813: σ = 0.97 mho/m ε = 54.0 ρ = 1.00 g/cm3; DAE3V1SN401 Cal date (8/26/02)
Cube 7x7x7: SAR (1g): 0.779 mW/g, SAR (10g): 0.540 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0; Max at 31.5, 46.5, 4.0
Power Drift: -0.47 dB

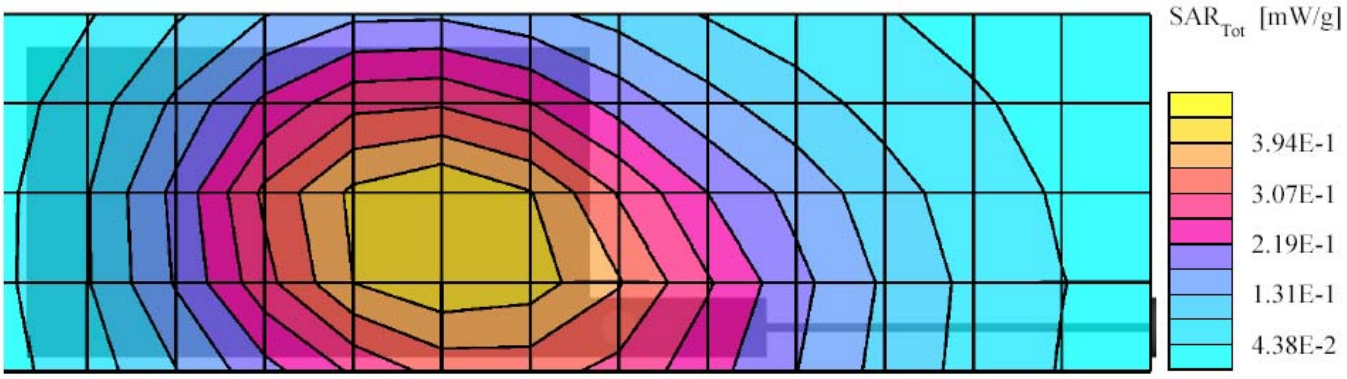


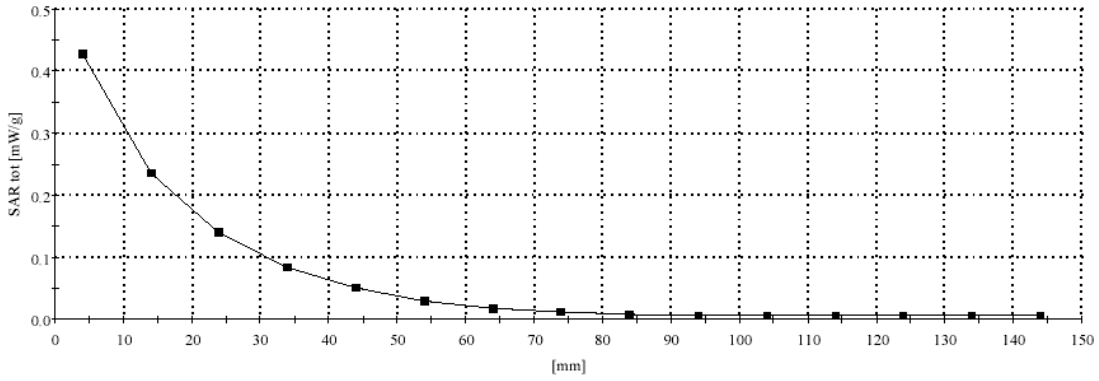


FCC ID: AZ489FT5808; Test Date: 3/20/03
Motorola CGISS EME Laboratory
Run #: R2-030320-07-CM
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 21.3C
Tx freq: 813.5125 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NNTN4126A
Audio/data accessories: NTN8513A

DUT w/ carry against phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 3.0; FCC Body 813: $\sigma = 0.97$ mho/m $\varepsilon = 53.8$ $\rho = 1.00$ g/cm3; DAE3V1SN401 Cal date (8/26/02)
Cube 7x7x7: SAR (1g): 0.432 mW/g, SAR (10g): 0.309 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0; Max at 36.0, 75.0, 4.0
Power Drift: -0.03 dB

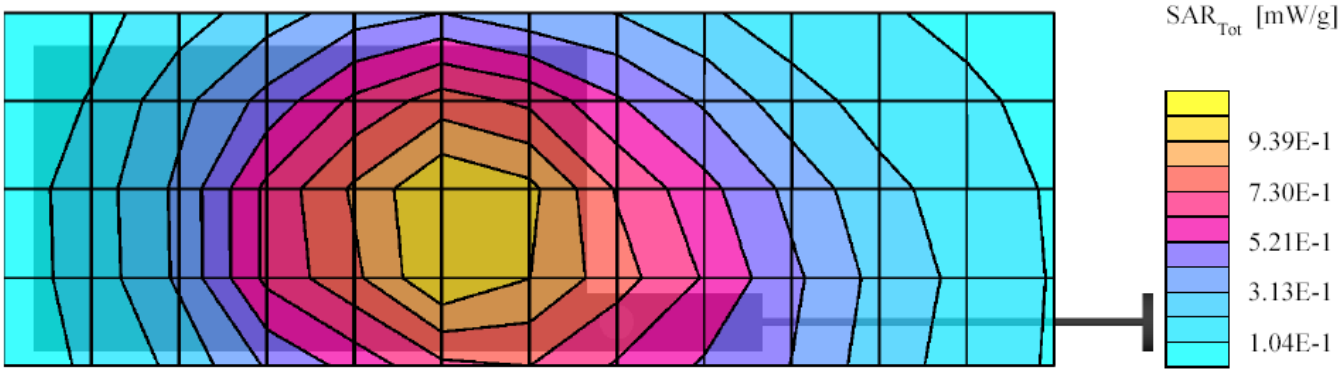


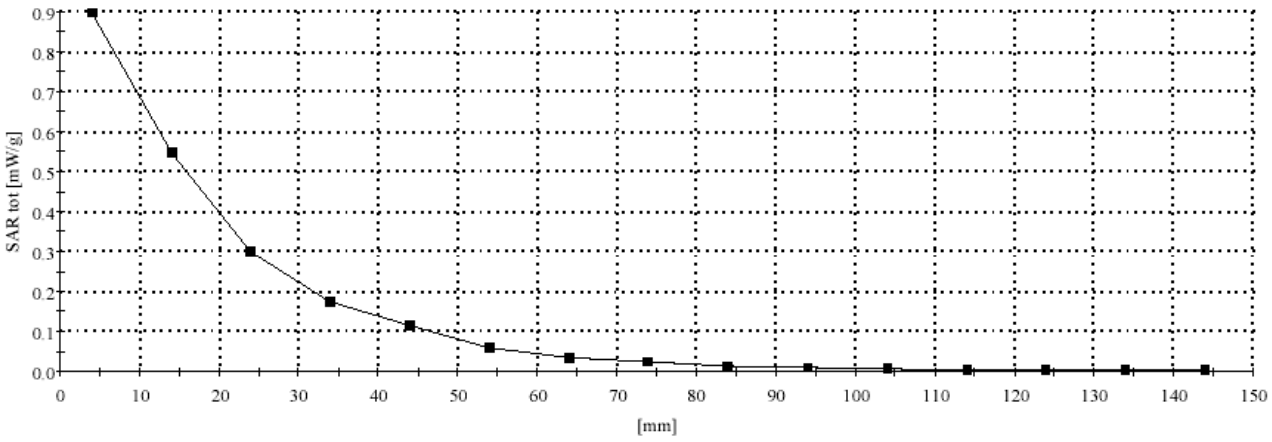


FCC ID: AZ489FT5808; Test Date: 3/21/03
Motorola CGISS EME Laboratory
Run #: R2-030321-03-KU
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 21.1C
Tx freq: 806.0125 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NNTN4126A
Audio/data accessories: NONE

DUT w/ carry case against phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 1.5; FCC Body 813: σ = 0.97 mho/m ε = 54.3 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cube 7x7x7: SAR (1g): 0.972 mW/g, SAR (10g): 0.701 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0; Max at 37.5, 78.0, 4.0
Power Drift: -0.78 dB

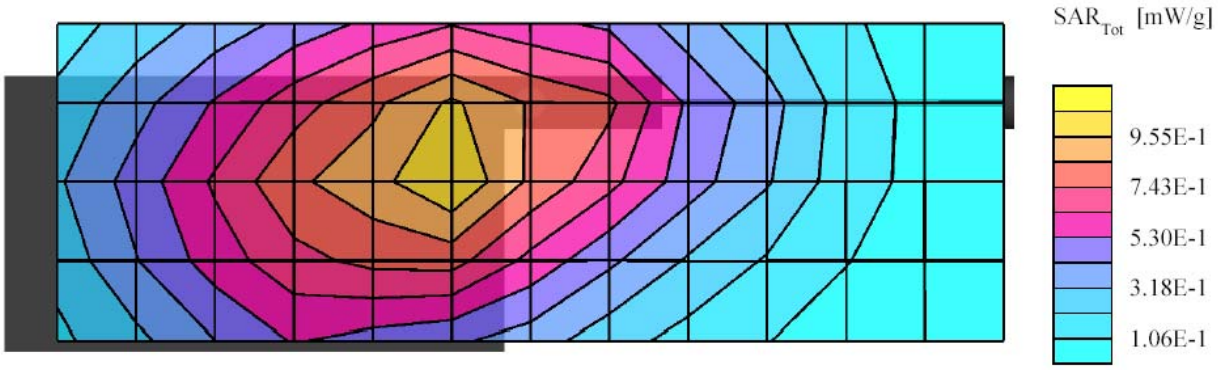


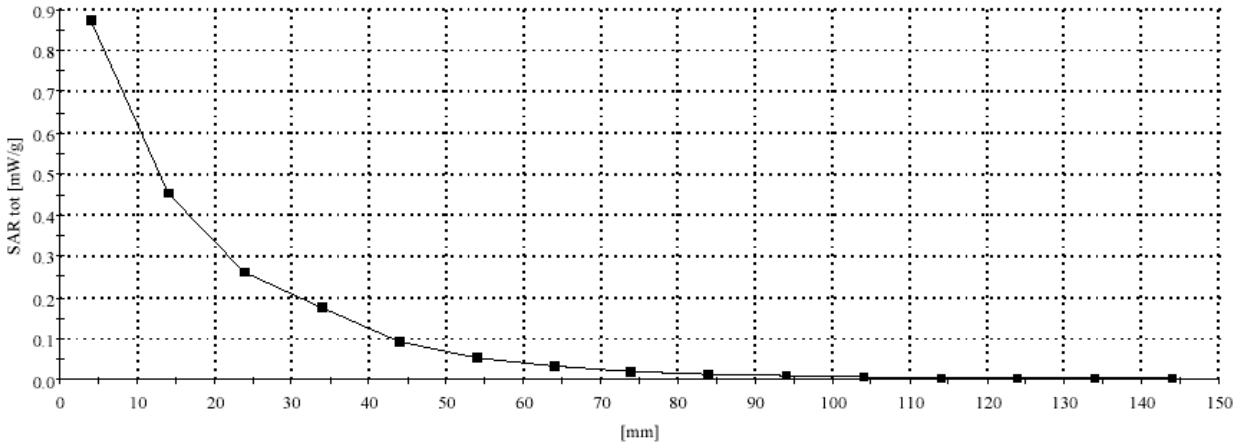


FCC ID: AZ489FT5808; Test Date: 3/21/03
Motorola CGISS EME Laboratory
Run #: R2-030321-08-KU
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 21.2C
Tx freq: 813.5125 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NONE, Back radio @ 2.5cm
Audio/data accessories: NONE

DUT w/ back 2.5cm separation distance from phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.20,6.20,6.20); Probe cal date: 28/09/02; Crest factor: 1.5; FCC Body 813: σ = 0.97 mho/m ε = 54.3 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cube 7x7x7: SAR (1g): 0.932 mW/g, SAR (10g): 0.638 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 25.5, 75.0, 4.0
Power Drift: -0.77 dB

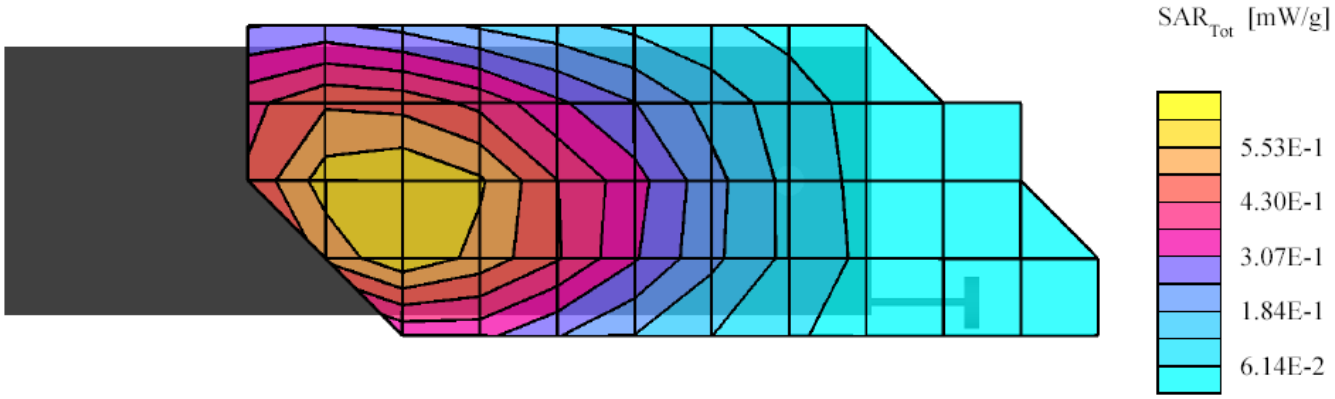


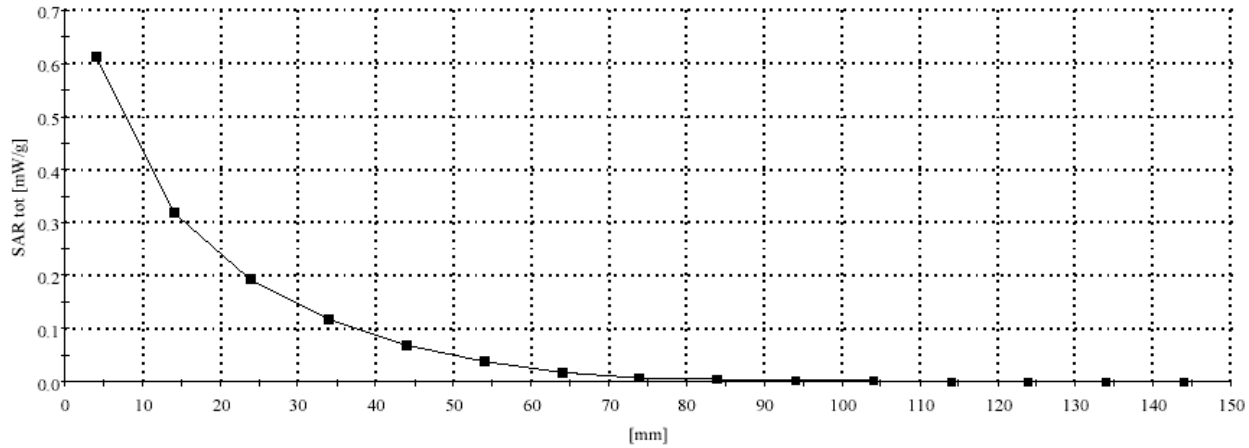


FCC ID: AZ489FT5808; Test Date: 3/24/03
Motorola CGISS EME Laboratory
Run #: R2-030324-03-KU
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 20.6C
Tx freq: 813.5125 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NONE
Audio/data accessories: NONE

DUT at the Left ear
SAM Phantom; Left ear Section; Position: (90°,59°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.50,6.50,6.50); Probe cal date: 28/09/02; Crest factor: 3.0; IEEE HEAD 813MHz: σ = 0.87 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cube 7x7x7: SAR (1g): 0.611 mW/g, SAR (10g): 0.434 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 45.0, 22.5, 4.0
Power Drift: -0.25 dB

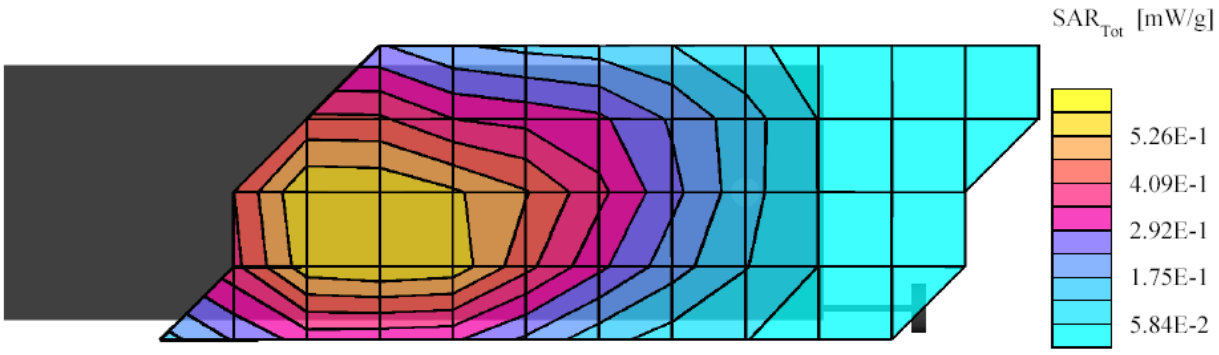


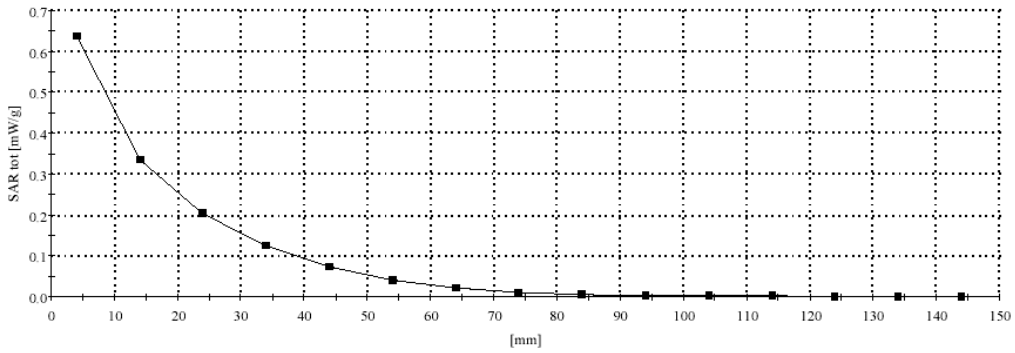


FCC ID: AZ489FT5808; Test Date: 3/24/03
Motorola CGISS EME Laboratory
Run #: R2-030324-15-CM
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 20.8C
Tx freq: 813.5125 MHz

Antenna position: OUT
Battery kit: SNN5704A (NNTN4306A battery back cover)
Carry Accessories: NONE
Audio/data accessories: NONE

DUT at the right ear
SAM Phantom; Righ ear Section; Position: (90°,301°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.50,6.50,6.50); Probe cal date: 28/09/02; Crest factor: 3.0; IEEE
HEAD 813MHz: σ = 0.87 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cube 7x7x7: SAR (1g): 0.608 mW/g, SAR (10g): 0.429 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 37.5, 24.0, 4.0
Power Drift: 0.11 dB

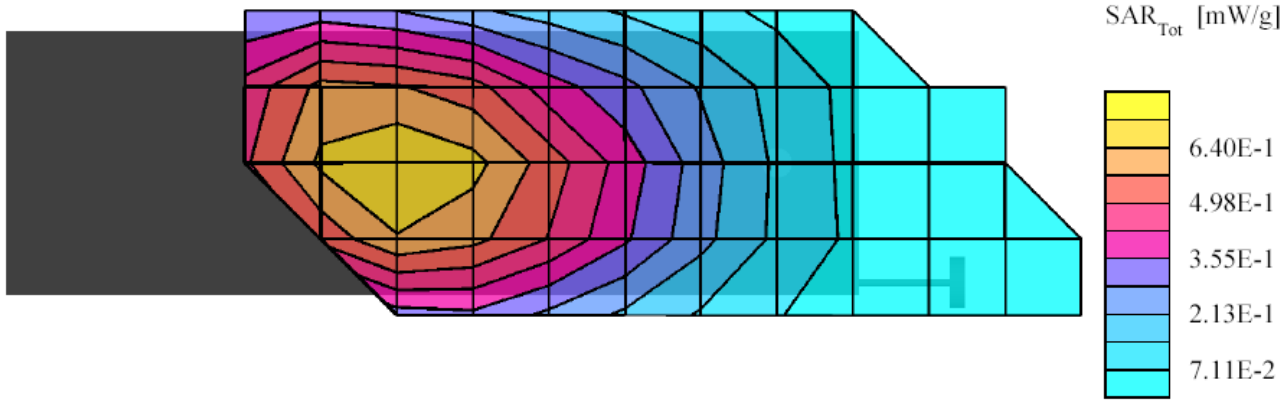


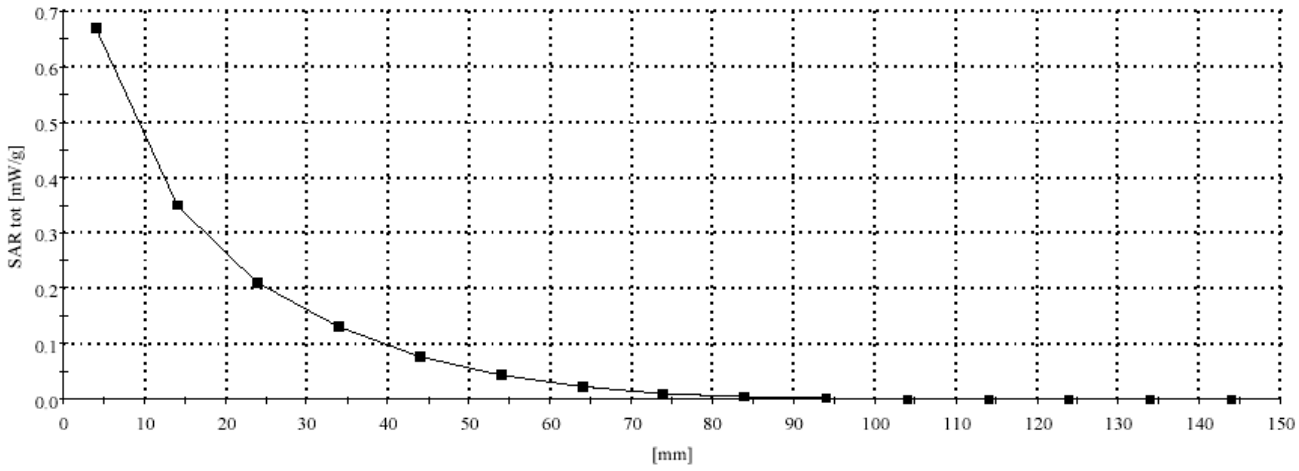


FCC ID: AZ489FT5808; Test Date: 3/25/03
Motorola CGISS EME Laboratory
Run #: R2-030325-10-CM
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 21.0C
Tx freq: 824.9875 MHz

Antenna position: OUT
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: RLN5334B
Audio/data accessories: NONE

DUT at the Left ear w/ carry case
SAM Phantom; Left Hand Section; Position: (90°,59°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.50,6.50,6.50); Probe cal date: 28/09/02; Crest factor: 3.0; IEEE
HEAD 813MHz: σ = 0.90 mho/m ε = 41.2 ρ = 1.00 g/cm3; DAE3V1SN401 Cal date (8/26/02)
Cube 7x7x7: SAR (1g): 0.652 mW/g, SAR (10g): 0.465 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 46.5, 27.0, 4.0
Power Drift: -0.06 dB

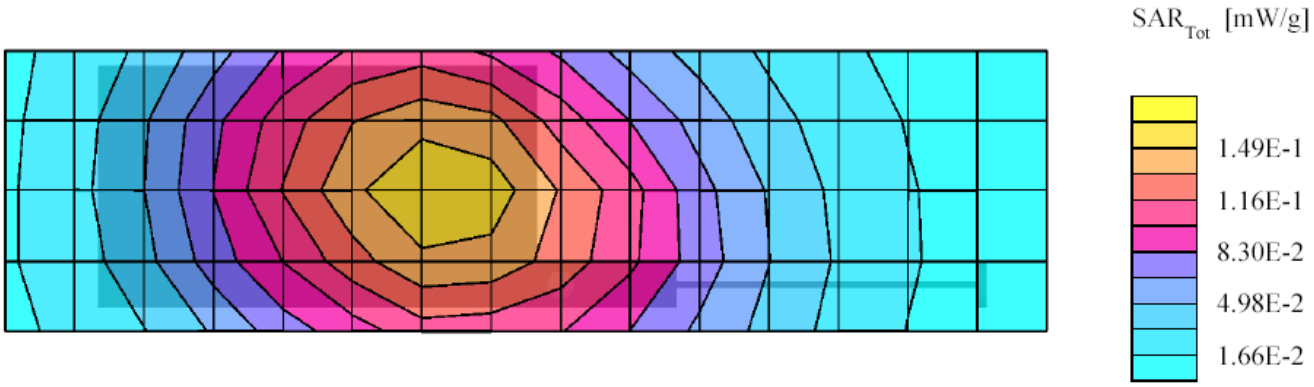


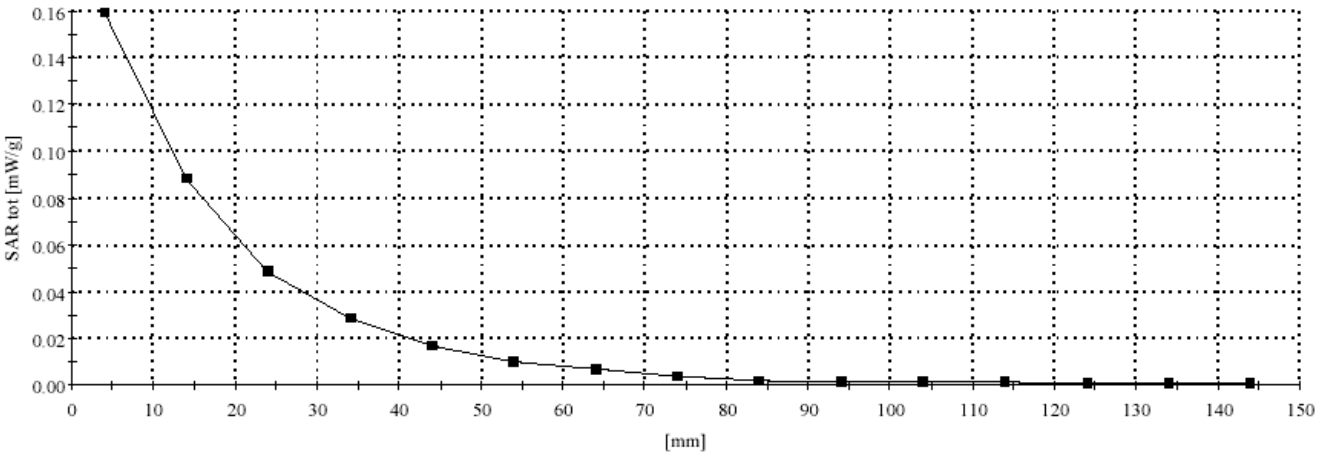


FCC ID: AZ489FT5808; Test Date: 3/27/03
Motorola CGISS EME Laboratory
Run #: R2-030327-04-KU
Model #: H59UAH6RR5AN S/N:919ADC061W
Simulated tissue temp: 21.3C
Tx freq: 806.0125

Antenna position: Out
Battery kit: SNN5717C (NNTN4306A battery back cover)
Carry Accessories: NONE
Audio/data accessories: NONE

DUT Flip closed, front of radio (flip side) facing phantom @ 2.5 cm separation
SAM Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002); ConvF(6.50,6.50,6.50); Probe cal date: 28/09/02; Crest factor: 6.0; IEEE
HEAD 813MHz: σ = 0.89 mho/m ε = 41.0 ρ = 1.00 g/cm3; DAE3V1SN401 Cal date (8/26/02)
Cube 7x7x7: SAR (1g): 0.153 mW/g, SAR (10g): 0.110 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 30.0, 94.5, 4.0
Power Drift: 1.84 dB





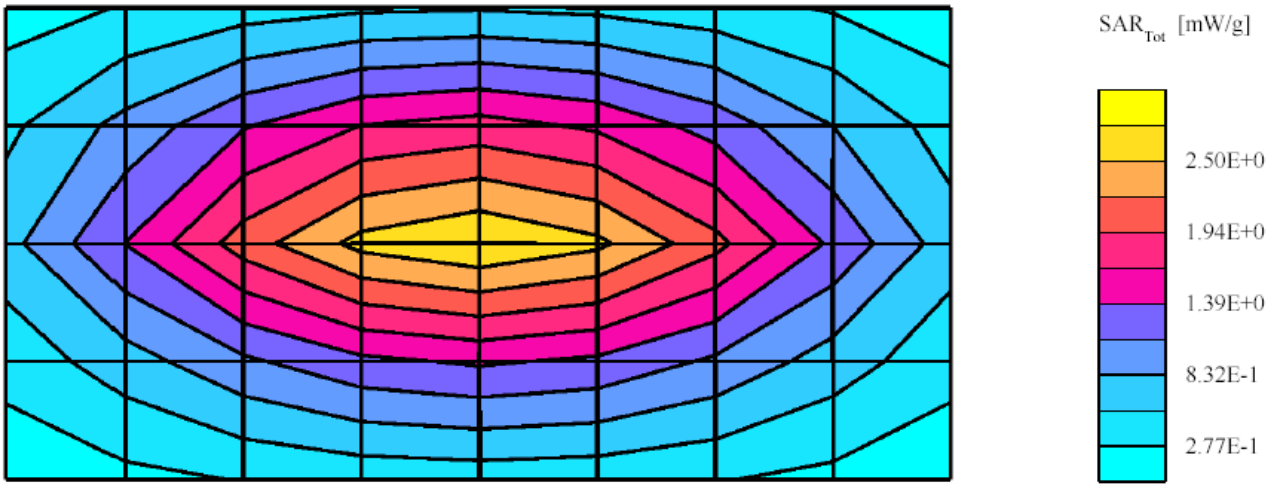
APPENDIX C

Dipole System Performance Check Results

SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/13/03
Motorola CGISS EME Lab
Run #: 030313-01
Tx Freq: 835MHz
Simulated tissue temp: 20.9C
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

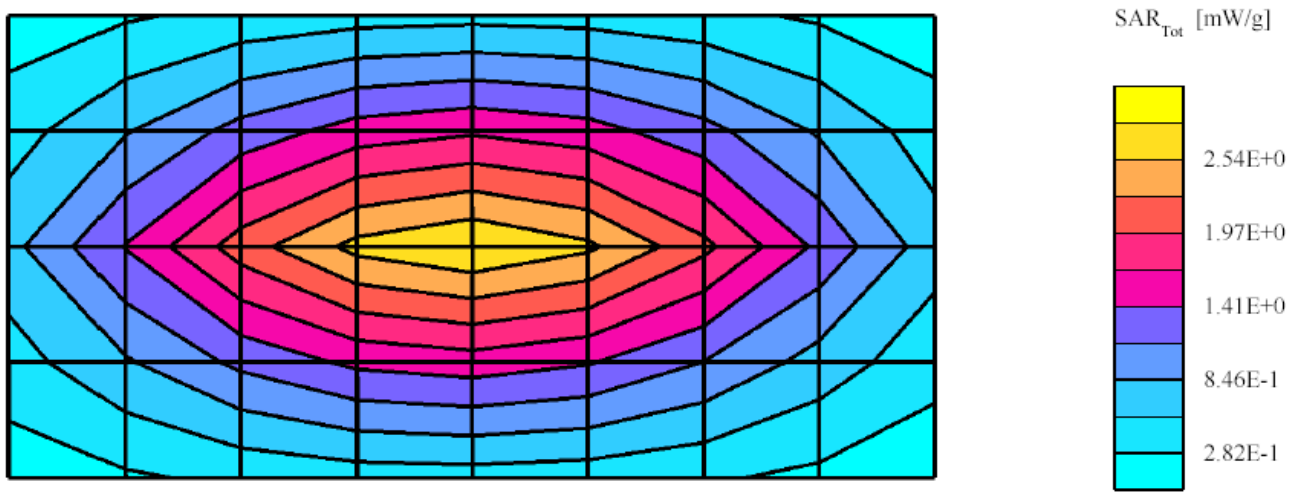
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.97mho/m ε= 53.2 ρ = 1.00 g/cm3; DAE3V1SN401 (8/26/02)
Cubes (3): Peak: 2.74 mW/g ± 16.89 dB, SAR (1g): 1.73 mW/g ± 17.06 dB, SAR (10g): 1.11 mW/g ± 17.01 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.9, 14.1) [mm]
Power drift: -0.06 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/14/03
Motorola CGISS EME Lab
Run #: 030314-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

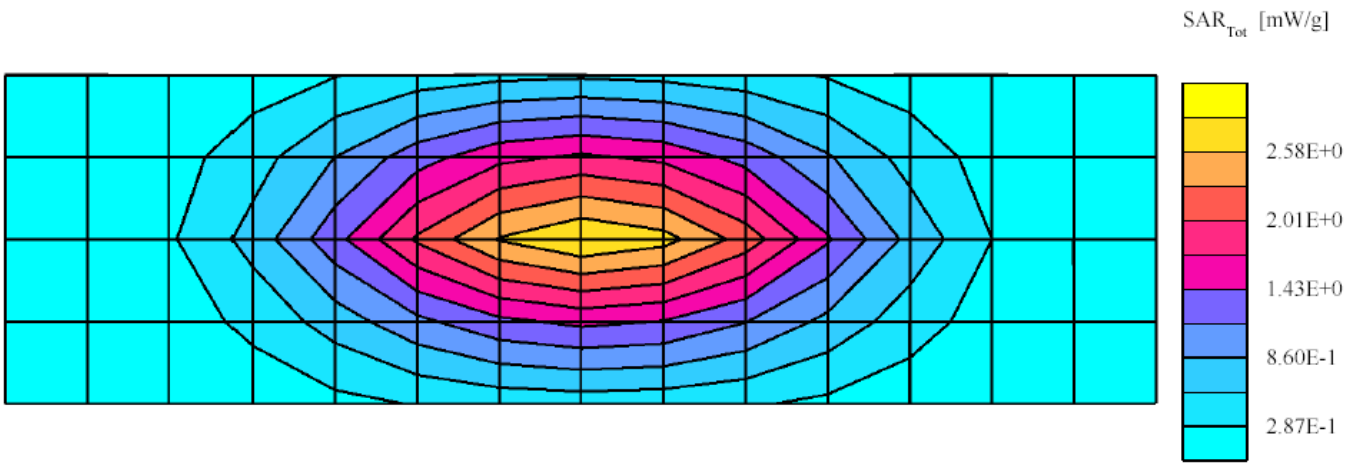
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.97 mho/m ε= 53.2 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (3): Peak: 2.78 mW/g ± 16.47 dB, SAR (1g): 1.75 mW/g ± 16.93 dB, SAR (10g): 1.12 mW/g ± 16.38 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.9, 14.1) [mm]
Power drift: 0.00 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date:3/17/03
Motorola CGISS EME Lab
Run #: 030317-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.7 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

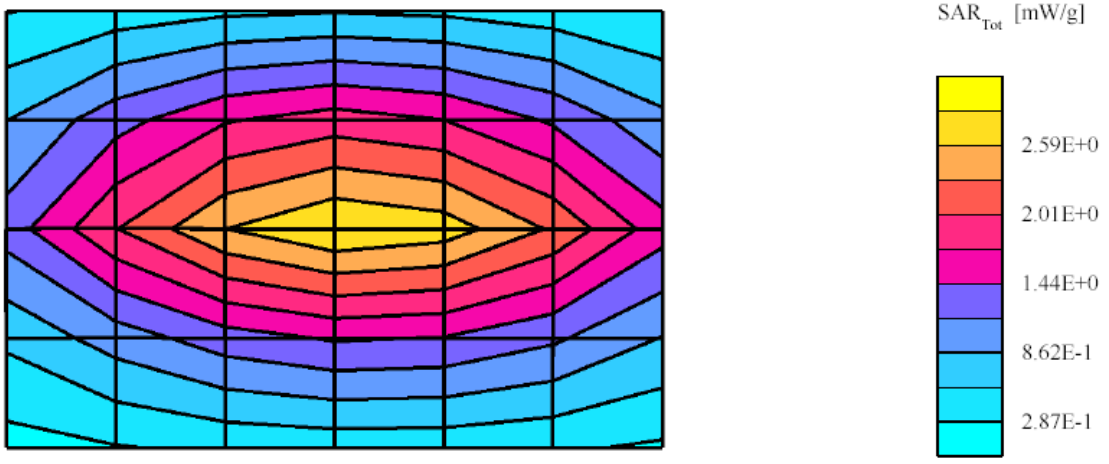
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.98 mho/m ε= 53.8 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (3): Peak: 2.79 mW/g ± 16.22 dB, SAR (1g): 1.77 mW/g ± 16.41 dB, SAR (10g): 1.13 mW/g ± 16.59 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.9, 14.1) [mm]
Power drift: 0.00 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/18/02
Motorola CGISS EME Lab
Run #: 030318-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.7 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

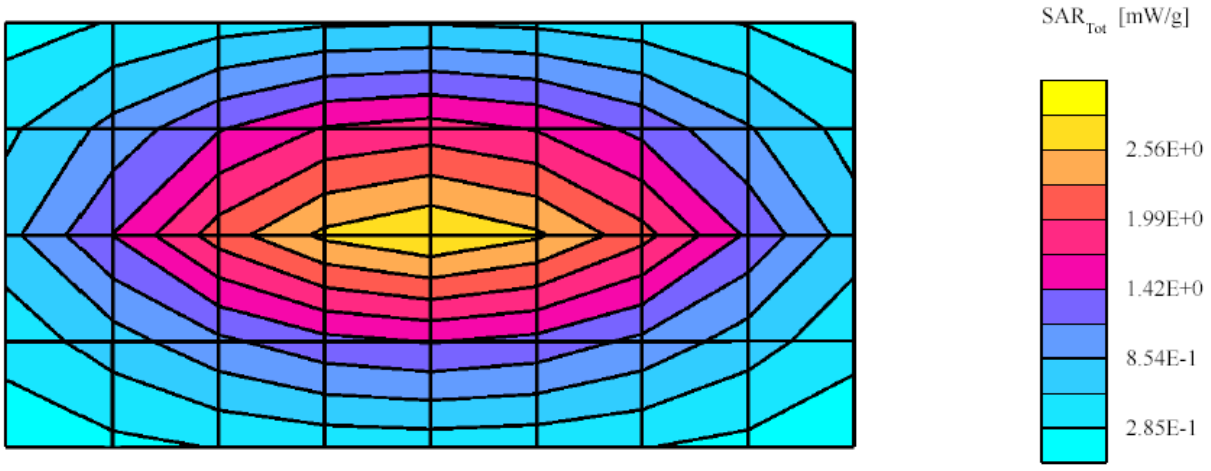
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.98 mho/m ε= 53.3 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (3): Peak: 2.86 mW/g ± 16.89 dB, SAR (1g): 1.80 mW/g ± 16.65 dB, SAR (10g): 1.15 mW/g ± 16.18 dB, (Worst-case extrapolation) Penetration depth: 12.2 (10.7, 14.0) [mm]
Power drift: 0.02 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/19/03
Motorola CGISS EME Lab
Run #: 030319-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

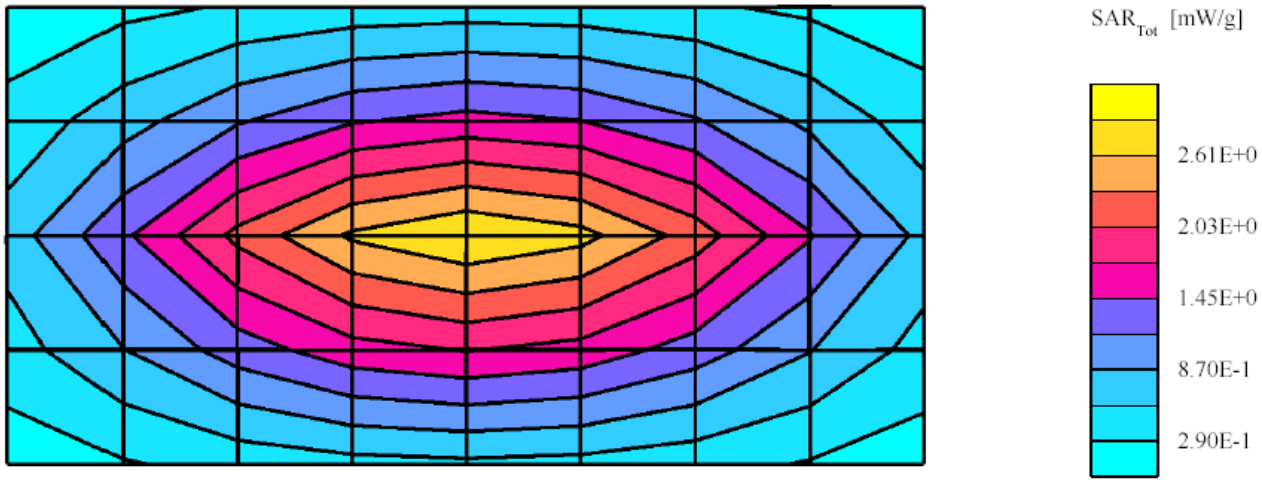
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.99 mho/m ε = 53.7 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (2): Peak: 4.20 mW/g ± 0.00 dB, SAR (1g): 2.65 mW/g ± 0.01 dB, SAR (10g): 1.70 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.8, 14.1) [mm]
Power drift: -0.01 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/20/03
Motorola CGISS EME Lab
Run #: 030320-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

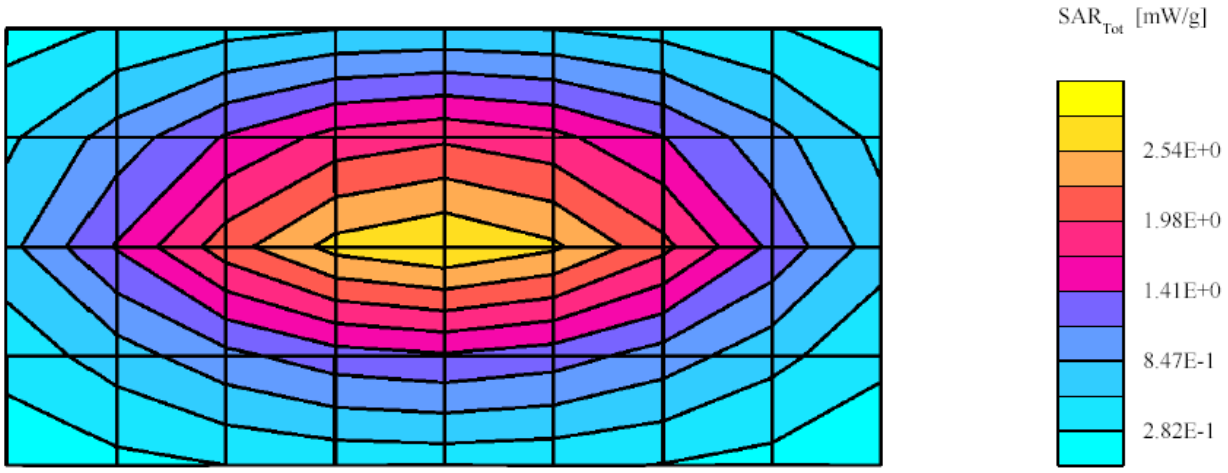
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.99 mho/m ε= 53.6 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (2): Peak: 4.26 mW/g ± 0.01 dB, SAR (1g): 2.68 mW/g ± 0.01 dB, SAR (10g): 1.72 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.8, 14.1) [mm]
Power drift: -0.04 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/21/03
Motorola CGISS EME Lab
Run #: 030321-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.3 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

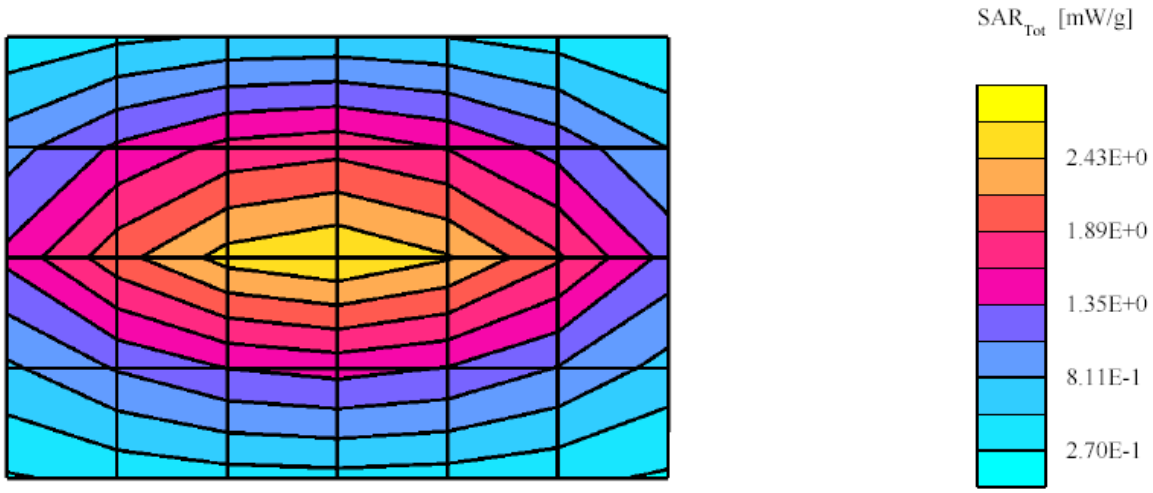
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.99 mho/m ε= 54.0 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (2): Peak: 4.21 mW/g ± 0.02 dB, SAR (1g): 2.66 mW/g ± 0.02 dB, SAR (10g): 1.71 mW/g ± 0.02 dB, (Worst-case extrapolation)Penetration depth: 12.3 (11.0, 14.1) [mm]
Power drift: 0.00 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/24/03
Motorola CGISS EME Lab
Run #: 030324-01
TX Freq: 835 MHz
Sim Tissue Temp: 20.5 (Celsius)
Start Power; 250mW

Target:
10.2mW/g for 1g-SAR, 6.56mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.04mW/g for 1g SAR, 6.44mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

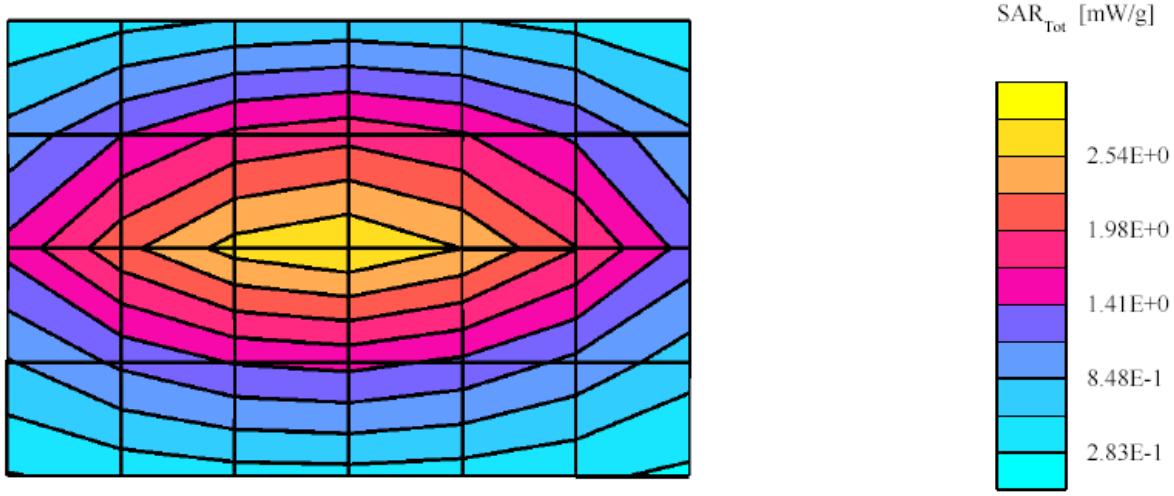
SAM; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.50,6.50,6.50); Crest factor: 1.0; IEEE Head 835MHz : σ = 0.89 mho/m ε= 40.7 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (2): Peak: 4.12 mW/g ± 0.01 dB, SAR (1g): 2.55 mW/g ± 0.02 dB, SAR (10g): 1.61 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.6 (10.2, 13.4) [mm]
Power drift: 0.03 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/25/03
Motorola CGISS EME Lab
Run #: 030325-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.1 (Celsius)
Start Power; 250mW

Target:
10.2mW/g for 1g-SAR, 6.56mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.04mW/g for 1g SAR, 6.44mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

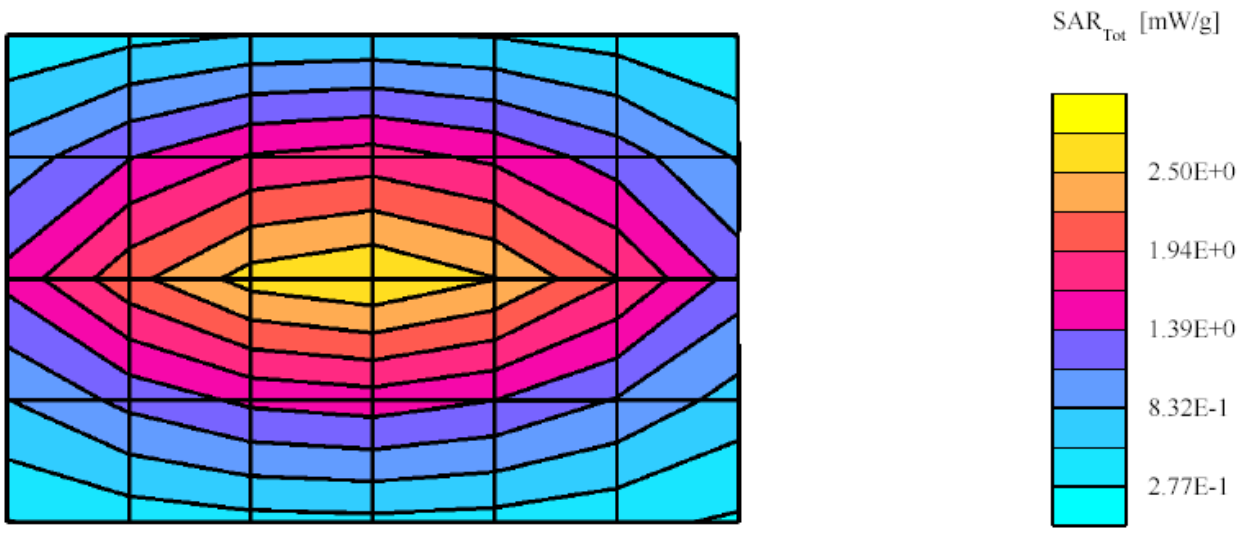
SAM; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.50,6.50,6.50); Crest factor: 1.0; IEEE Head 835MHz : σ = 0.93 mho/m ε= 40.9 ρ = 1.00 g/cm3; DAE3V1SN401 Cal Date (8/26/02)
Cubes (2): Peak: 4.28 mW/g ± 0.01 dB, SAR (1g): 2.65 mW/g ± 0.01 dB, SAR (10g): 1.68 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.6 (10.3, 13.4) [mm]
Power drift: 0.04 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/26/03
Motorola CGISS EME Lab
Run #: 030326-01
TX Freq: 835 MHz
Sim Tissue Temp: 20.7 (Celsius)
Start Power; 250mW

Target:
10.2mW/g for 1g-SAR, 6.56mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.04mW/g for 1g SAR, 6.44mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

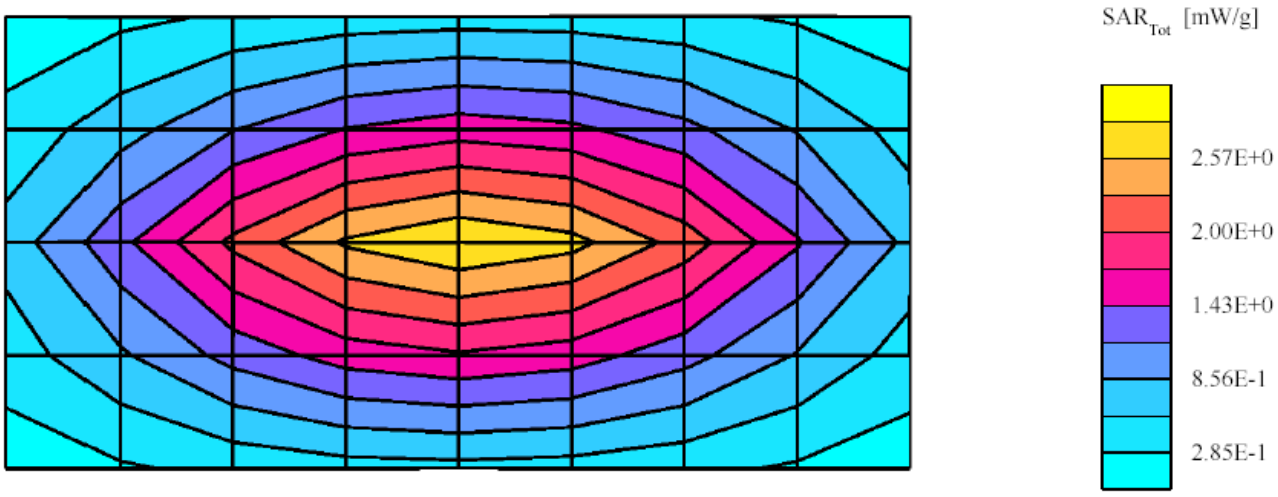
SAM; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.50,6.50,6.50); Crest factor: 1.0; IEEE Head 835MHz : $\sigma = 0.91$ mho/m $\varepsilon = 41.0$ $\rho = 1.00$ g/cm3
Cubes (2): Peak: 4.17 mW/g ± 0.01 dB, SAR (1g): 2.59 mW/g ± 0.01 dB, SAR (10g): 1.64 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.6 (10.3, 13.4) [mm]
Power drift: 0.02 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/27/03
Motorola CGISS EME Lab
Run #: 030327-07
TX Freq: 835 MHz
Sim Tissue Temp: 21.7 (Celsius)
Start Power; 250mW

Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.65mW/g for 1g SAR, 6.79mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

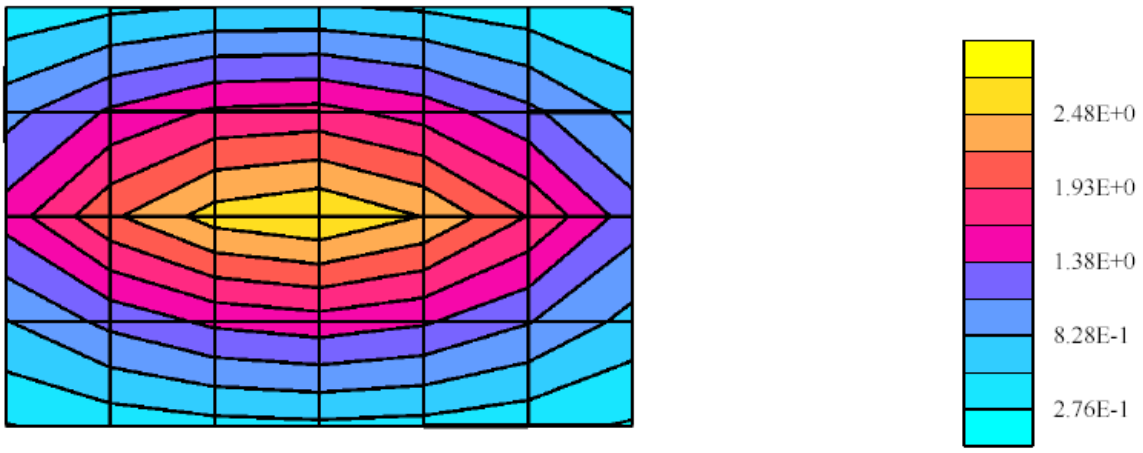
Flat; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; FCC Body 835: σ = 0.98 mho/m ε= 52.9 ρ = 1.00 g/cm3
Cubes (2): Peak: 4.19 mW/g ± 0.00 dB, SAR (1g): 2.64 mW/g ± 0.01 dB, SAR (10g): 1.69 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 12.3 (10.9, 14.0) [mm]
Power drift: -0.02 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/27/03
Motorola CGISS EME Lab
Run #: 030327-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.2 (Celsius)
Start Power; 250mW

Target:
10.2mW/g for 1g-SAR, 6.56mW/g for 10g-SAR, +/-11.72% from SPEAG Dipole certificate 2/11/02
10.04mW/g for 1g SAR, 6.44mW/g for 10g SAR, +/- 10% from system performance target 5/20/02

SAM; Probe: ET3DV6 - SN1547 (Cal Date 09-28-2002);Probe Cal Date: 28/09/02ConvF(6.50,6.50,6.50); Crest factor: 1.0; IEEE Head 835MHz : σ = 0.91 mho/m ε= 40.8 ρ = 1.00 g/cm3
Cubes (2): Peak: 4.15 mW/g ± 0.01 dB, SAR (1g): 2.58 mW/g ± 0.00 dB, SAR (10g): 1.64 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 11.6 (10.3, 13.4) [mm]
Power drift: 0.03 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	5/20/02	Frequency (MHz):	835
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS 2	Ambient Temp.(°C):	21.9
Probe Serial #:	1383	Tissue Temp.(°C):	21.0
DAE Serial #:	374 V2		

Tissue Characteristics		Phantom Type/SN:	ACL40232002B
Permitivity:	53.2	Distance (mm):	15
Conductivity:	0.97		

Reference Source: 835 (Dipole)
Reference SN: 426

Power to Dipole: 250 mW

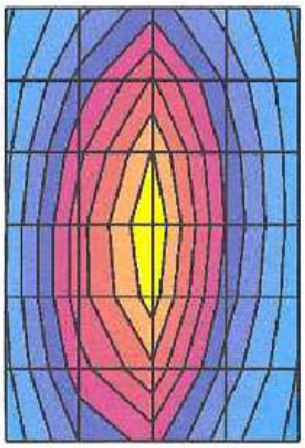
Measured SAR Value: 2.65 mW/g, 1.69 mW/g (10g avg.)
Power Drift: -0.02 dB

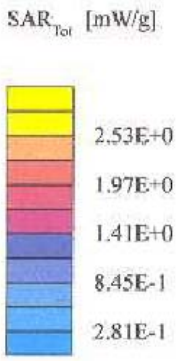
New Target/Measured SAR Value: 10.65 mW/g, 6.79 mW/g (10g avg.)
(normalized to 1.0 W, with drift compensation)

Test performed by: Kim Uong Initial: KU

Dipole D835V2 SN426; Test date:05/20/02

Run #: 02052001 Phantom #ACL40232002B/S11
Model#: SPEAG dipole D835V2 SN426
Robot#: CGISS-2 DAE: DAE3V1 SN374 (2/11/02) Tester: Kim Uong
Tx Freq: 835MHz Simulated tissue temp: 21.0C
Start power: 250mW
Target:
10.5mW/g for 1g-SAR, 6.8mW/g for 10g-SAR, +/-12.1% from SPEAG Dipole certificate 2/11/02
Flat; Probe: ET3DV6 - SN1383; ConvF(6.50,6.50,6.50); Crest factor: 1.0; FCC Body 835: σ = 0.97 mho/m ε_r = 53.2 ρ = 1.00 g/cm^3
Cube 7x7x7: Peak: 4.25 mW/g, SAR (1g): 2.65 mW/g, SAR (10g): 1.69 mW/g, (Worst-case extrapolation)
Penetration depth: 12.1 (10.6, 14.1) [mm]
Powerdrift: -0.02 dB





Motorola CGISS EME Lab

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	__4/19/02__	Frequency (MHz):__835__	
Lab Location:	__CGISS____	Mixture Type: __IEEE Head_	
Robot System:	__CGISS-3___	Ambient Temp.(°C):	__22.0____
Probe Serial #:	__1393_____	Tissue Temp. (°C):	__21.2_____
DAE Serial #:	___406_____		

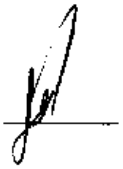
Tissue Characteristics		Phantom Type/SN:	_SAMTP1022__
Permitivity:	____40.3_____	Distance:	__15mm_____
Conductivity:	____0.92____		

Reference Source: __D835V2___(Dipole)
Reference SN: __426_____

Power to Dipole: ___250_____ mW

Measured SAR Value: __2.51_ mW/g, __1.61_ mW/g (10g avg.)
Power Drift: __0___ dB

New Target/Measured SAR Value: __10.04__ mW/g, __6.44__ mW/g (10g avg.)
(normalized to 1.0 W, with drift compensation)

Test performed by: _____Jim Fortier_____ Initial: 

JF 2/18/02

Dipole D835V2 SN426; Test date:04/19/02

Run #: Sys Val_R3_020419-03a
Model #: SPEAG D835V2
Robot: CGISS-3
TX Freq: 835 MHz
Start Power; 250mW
DAE3: SN:406

Phantom #:SAMTP1022
SN: 426
Tester: J. Fortier
Sim Tissue Temp: 21.8 (Celsius)

DAE Cal Date: 02/08/02

- Comments-

IEEE1528 Target at 1W is 9.5 mW/g (1g)
SAR calculated is 10.04 mW/g, Percent from target (including drift) for 1g is +5.7 %
SAM; Probe: ET3DV6 - SN1393 SPEAG; ConvF(7.20,7.20,7.20); Crest factor: 1.0; IEEE HEAD 835MHz: σ = 0.92 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3
Cube 7x7x7: Peak: 3.95 mW/g, SAR (1g): 2.51 mW/g, SAR (10g): 1.61 mW/g, (Worst-case extrapolation)
Penetration depth: 12.0 (11.0, 13.3) [mm]
Powerdrift: 0.00 dB

APPENDIX D

Calibration Certificates

Schmid & Partner
Engineering AG

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

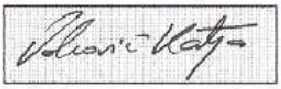
Calibration Certificate

Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1547**
Place of Calibration:	**Zurich**
Date of Calibration:	**September 28, 2002**
Calibration Interval:	**12 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:	

DASY - Parameters of Probe: ET3DV6 SN:1547

Sensitivity in Free Space

		Diode Compression		
NormX	1.37 $\mu V/(V/m)^2$	DCP X	90	mV
NormY	1.23 $\mu V/(V/m)^2$	DCP Y	90	mV
NormZ	1.23 $\mu V/(V/m)^2$	DCP Z	90	mV

Sensitivity in Tissue Simulating Liquid

Head	**835 MHz**	ε_r = **41.5 ± 5%**	σ = **0.90 ± 5% mho/m**
Head	**900 MHz**	ε_r = **41.5 ± 5%**	σ = **0.97 ± 5% mho/m**
	ConvF X	**6.5** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**6.5** ± 9.5% (k=2)	Alpha **1.47**
	ConvF Z	**6.5** ± 9.5% (k=2)	Depth **1.19**
Head	**1900 MHz**	ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**
Head	**1800 MHz**	ε_r = **40.0 ± 5%**	σ = **1.40 ± 5% mho/m**
	ConvF X	**5.2** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**5.2** ± 9.5% (k=2)	Alpha **0.63**
	ConvF Z	**5.2** ± 9.5% (k=2)	Depth **2.21**

Boundary Effect

Head **835 MHz** **Typical SAR gradient: 5 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	7.1	2.9
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

Head **1900 MHz** **Typical SAR gradient: 10 % per mm**

Probe Tip to Boundary		**1 mm**	**2 mm**
SAR_{be} [%]	Without Correction Algorithm	13.2	8.5
SAR_{be} [%]	With Correction Algorithm	0.1	0.4

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.3 ± 0.2**	mm

Schmid & Partner
Engineering AG

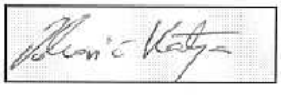
Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1547**
Place of Assessment:	**Zurich**
Date of Assessment:	**September 30, 2002**
Probe Calibration Date:	**September 28, 2002**

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:1547

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.0 ± 8%**	ε_r = **61.9** ±5% σ = **0.80** ±5% **mho/m** (body tissue)
236 MHz	ConvF	**7.8 ± 8%**	ε_r = **59.8** ±5% σ = **0.87** ±5% **mho/m** (body tissue)
300 MHz	ConvF	**7.7 ± 8%**	ε_r = **58.2** ±5% σ = **0.92** ±5% **mho/m** (body tissue)
350 MHz	ConvF	**7.6 ± 8%**	ε_r = **57.7** ±5% σ = **0.93** ±5% **mho/m** (body tissue)
450 MHz	ConvF	**7.3 ± 8%**	ε_r = **56.7** ±5% σ = **0.94** ±5% **mho/m** (body tissue)
784 MHz	ConvF	**6.4 ± 8%**	ε_r = **55.4** ±5% σ = **0.97** ±5% **mho/m** (body tissue)
1450 MHz	ConvF	**5.3 ± 8%**	ε_r = **54.0** ±5% σ = **1.30** ±5% **mho/m** (body tissue)

Dosimetric E-Field Probe ET3DV6R SN:1545

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.8 ± 8%**	ε_r = 52.3 ±5% σ = 0.76 ±5% mho/m (head tissue)
236 MHz	ConvF	**8.0 ± 8%**	ε_r = 48.3 ±5% σ = 0.82 ±5% mho/m (head tissue)
300 MHz	ConvF	**7.6 ± 8%**	ε_r = 45.3 ±5% σ = 0.87 ±5% mho/m (head tissue)
350 MHz	ConvF	**7.5 ± 8%**	ε_r = 44.7 ±5% σ = 0.87 ±5% mho/m (head tissue)
400 MHz	ConvF	**7.4 ± 8%**	ε_r = 44.4 ±5% σ = 0.87 ±5% mho/m (head tissue)
450 MHz	ConvF	**7.3 ± 8%**	ε_r = 43.5 ±5% σ = 0.87 ±5% mho/m (head tissue)
784 MHz	ConvF	**6.6 ± 8%**	ε_r = 41.8 ±5% σ = 0.90 ±5% mho/m (head tissue)
835 MHz	ConvF	**6.5 ± 8%**	ε_r = 42.5 ±5% σ = 0.98 ±5% mho/m (head tissue)
1450 MHz	ConvF	**5.7 ± 8%**	ε_r = 40.4 σ = 1.20 mho/m (head tissue)

Schmid & Partner
Engineering AG

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

Calibration Certificate

835 MHz System Validation Dipole

Type:	D835V2
Serial Number:	426
Place of Calibration:	Zurich
Date of Calibration:	February 11, 2002
Calibration Interval:	24 months

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

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

Calibrated by:	
Approved by:	

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with head simulating solution of the following electrical parameters at 835 MHz:

Relative Dielectricity	**41.9**	± 5%
Conductivity	**0.89 mho/m**	± 5%

The DASY3 System (Software version 3.1d) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.5) 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. SAR Measurement

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

averaged over 1 cm^3 (1 g) of tissue:	**10.2 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.56 mW/g**

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

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.375 ns**	(one direction)
Transmission factor:	**0.997**	(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 835 MHz:	Re{Z} = **50.3 Ω**
	Im {Z} = **-2.1 Ω**
Return Loss at 835 MHz	**-33.8 dB**

4. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with body simulating solution of the following electrical parameters at 835 MHz:

Relative Dielectricity	**55.4**	± 5%
Conductivity	**0.96 mho/m**	± 5%

The DASY3 System (Software version 3.1d) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.2) 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.

5. SAR Measurement

Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 4. The results have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**10.5 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.80 mW/g**

6. Dipole Impedance and Return Loss

The dipole was positioned at the flat phantom sections according to section 4 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 835 MHz:	Re{Z} = **46.0 Ω**
	Im {Z} = **-4.6 Ω**
Return Loss at 835 MHz	**-24.1 dB**

7. 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.

8. 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.

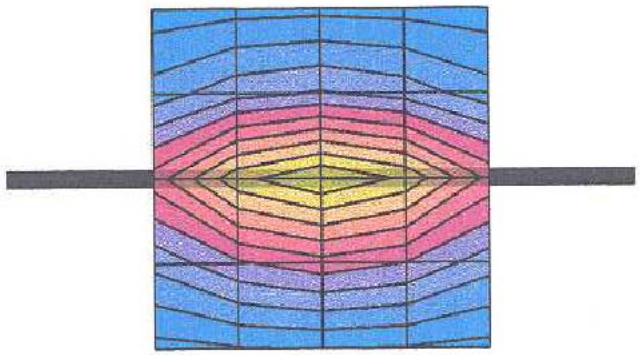
9. Power Test

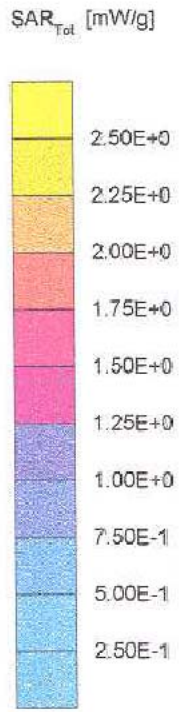
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

02/11/02

Validation Dipole D835V2 SN:426, d = 15 mm

Frequency: 835 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; IEEE1528 835 MHz; σ = 0.89 mho/m ε_r = 41.9 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.09 mW/g ± 0.04 dB, SAR (1g): 2.56 mW/g ± 0.03 dB, SAR (10g): 1.64 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 11.9 (10.5, 13.8) [mm]
Powerdrift: -0.00 dB



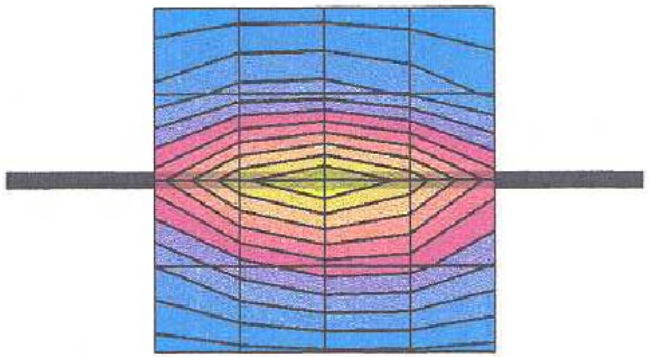


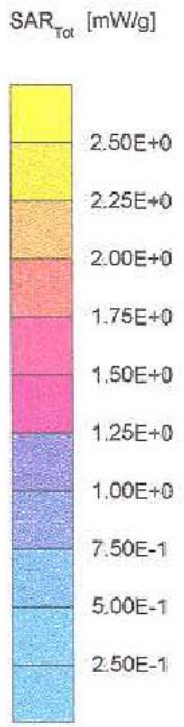
Schmid & Partner Engineering AG, Zurich, Switzerland

02/11/02

Validation Dipole D835V2 SN:426, d = 15 mm

Frequency: 835 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(6.20,6.20,6.20) at 900 MHz; Muscle 835 MHz; σ = 0.96 mho/m ε_r = 55.4 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.16 mW/g ± 0.01 dB, SAR (1g): 2.63 mW/g ± 0.00 dB, SAR (10g): 1.70 mW/g ± 0.01 dB, (Worst-case extrapolation)
Penetration depth: 12.5 (11.0, 14.4) [mm]
Powerdrift: -0.01 dB





APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT5808. 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 NNTN4126A
Front View

Photo 2.
Model NNTN4126A
Back View

Photo 3.
Model NNTN4126A
Side View

Photo 4.
Model RLN5334B
Back View

Photo 5.
Model RLN5334B
Front View

Photo 6.
Model RLN5334B
Side View

Photo 7.
Model RLN5336B
Back View

Photo 8.
Model RLN5336B
Front View

Photo 9.
Model RLN5336B
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
NNTN4126A	Yes	39-51	NA
NTN9687A	No	39-51	BS to NNTN4126A , except for color
RLN5334B	Yes	29-35	NA
RLN5336B	Yes	41-60	NA

Audio Acc. Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
SYN7875C	Yes	NA	NA
SYN8390B	Yes	NA	NA
SYN8146C	Yes	NA	NA
NTN8513A	Yes	NA	NA

Data cables Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
NKN6544B	Yes	NA	NA
NKN6540A	Yes	NA	NA
SKN6311A	Yes	NA	NA
NNTN4007A	Yes	NA	NA
NNTN4049A	Yes	NA	NA