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:	October 10, 2002
Report Revision:	Rev. O
Manufacturer:	Motorola
Product Description:	Portable 438-470 MHz 1-4W 16 Channel
FCC ID:	**ABZ99FT4056**
Device Model:	AAH50RDC9AA2AN

Test Period:	9/18/02 – 10/04/02
Test Engineer:	Stephen Whalen Sr. Test engineer
Author:	Michael Sailsman EME Regulatory Affairs

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.

/s/ Ken Enger — 10/11/02

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

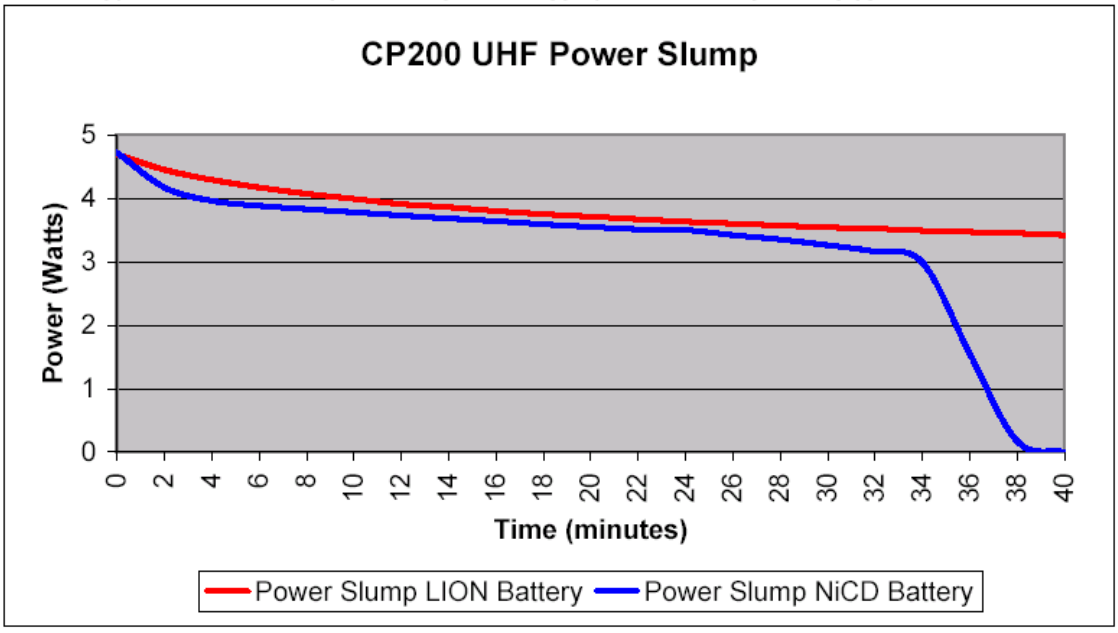
Date Approved

APPENDIX A

Power Slump Data/Shortened Scan

DUT Power versus time data

Start Date and Time:10/5/2002 12:32:06 PM			Start Date and Time:10/5/2002 1:28:21 PM		
Stop Date and Time: 10/5/2002 1:12:09 PM			Stop Date and Time: 10/5/2002 2:08:25 PM		
Radio sn	WDEXF3WQ				
Battery	Li Ion, NiCd				
	Time	Li Ion			NiCd
12:32:08 PM	0	4.69	1:28:24 PM	0	4.72
12:34:08 PM	2	4.45	1:30:24 PM	2	4.17
12:36:08 PM	4	4.29	1:32:24 PM	4	3.96
12:38:09 PM	6	4.17	1:34:24 PM	6	3.88
12:40:09 PM	8	4.07	1:36:24 PM	8	3.83
12:42:09 PM	10	3.99	1:38:24 PM	10	3.78
12:44:09 PM	12	3.91	1:40:24 PM	12	3.73
12:46:09 PM	14	3.86	1:42:25 PM	14	3.68
12:48:09 PM	16	3.8	1:44:25 PM	16	3.64
12:50:09 PM	18	3.75	1:46:25 PM	18	3.59
12:52:09 PM	20	3.71	1:48:25 PM	20	3.55
12:54:09 PM	22	3.67	1:50:25 PM	22	3.51
12:56:09 PM	24	3.63	1:52:25 PM	24	3.50
12:58:09 PM	26	3.6	1:54:25 PM	26	3.42
1:00:09 PM	28	3.57	1:56:25 PM	28	3.35
1:02:09 PM	30	3.54	1:58:25 PM	30	3.26
1:04:09 PM	32	3.52	2:00:25 PM	32	3.16
1:06:09 PM	34	3.49	2:02:25 PM	34	2.99
1:08:09 PM	36	3.47	2:04:25 PM	36	1.55
1:10:09 PM	38	3.45	2:06:25 PM	38	0.17
1:12:09 PM	40	3.42	2:08:25 PM	40	0.00



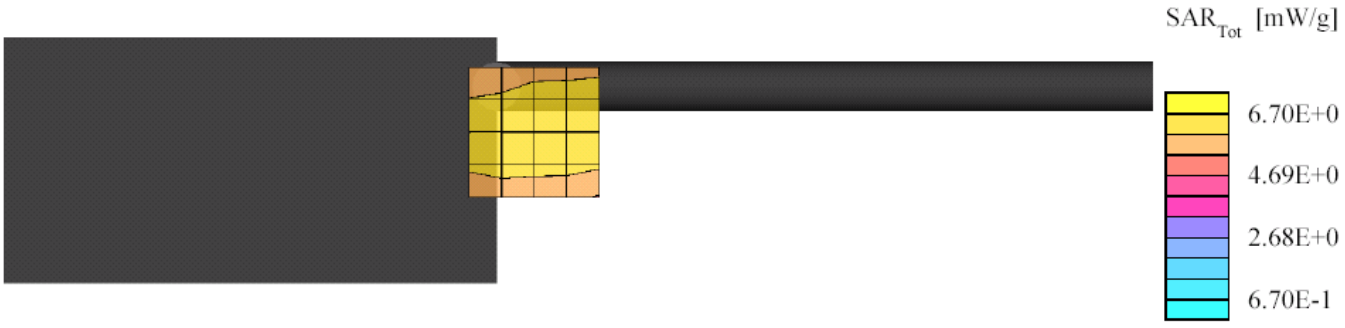
Shortened Scan Results

FCC ID: ABZ99FT4056; Test Date: 10/04/02
Motorola CGISS EME Laboratory
Run #: Face-R1-021004-04
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 470 MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4497A
Carry: none
Audio Acc. None

Shortened scan reflect highest S.A.R. producing configuration at the face
Run time 7 minutes
Representative "normal" scan run time was 25 minutes
"Shortened" scan measured S.A.R. w/ 50% duty cycle = 2.38 mW/g
"Normal" scan max. calc. S.A.R. w/ 50% duty cycle = 2.68 mW/g (see section 7.1 run # Face-R1-021003-05)

Mic @ 2.5cm from phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.00,7.00,7.00); Probe cal date: 21/05/02; Crest factor: 1.0; IEEE Head_454MHz: σ = 0.88 mho/m ε = 42.3 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 4.76 mW/g, SAR (10g): 3.46 mW/g * Max outside, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 4.76 mW/g, SAR (10g): 3.46 mW/g * Max outside

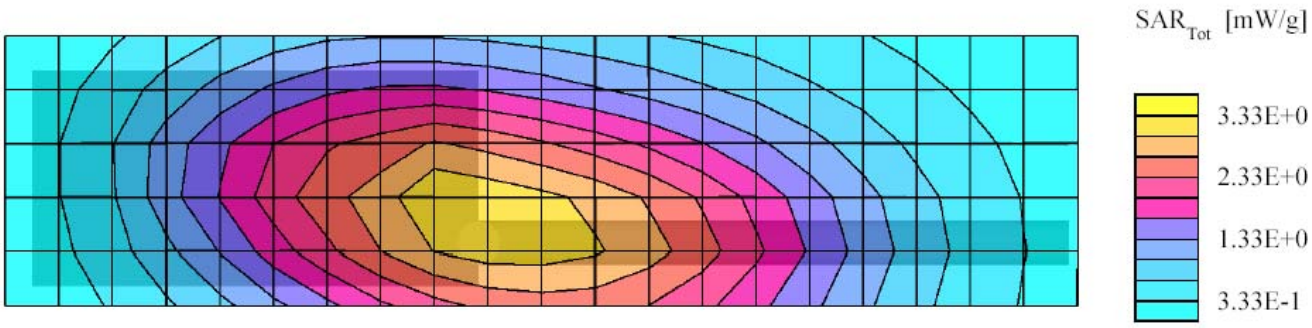


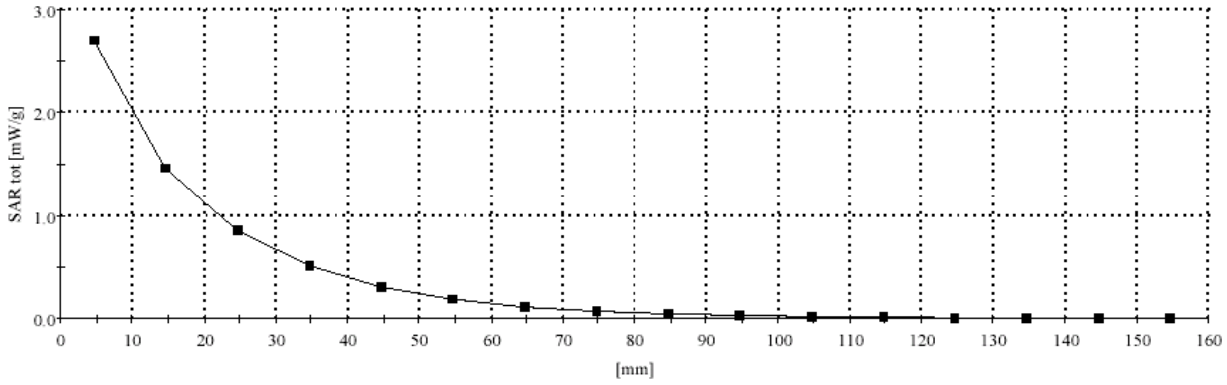
APPENDIX B
Data Results

FCC ID: ABZ99FT4056; Test Date: 09/19/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020919-03
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 461 MHz
Sim Tissue Temp: 21.2 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4496A
Carry: belt clip HLN8255B
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Prototype - Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.10,7.10,7.10); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_454MHz: σ = 0.91 mho/m ε = 54.7 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 3.03 mW/g, SAR (10g): 2.18 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 48.0, 124.5, 4.7

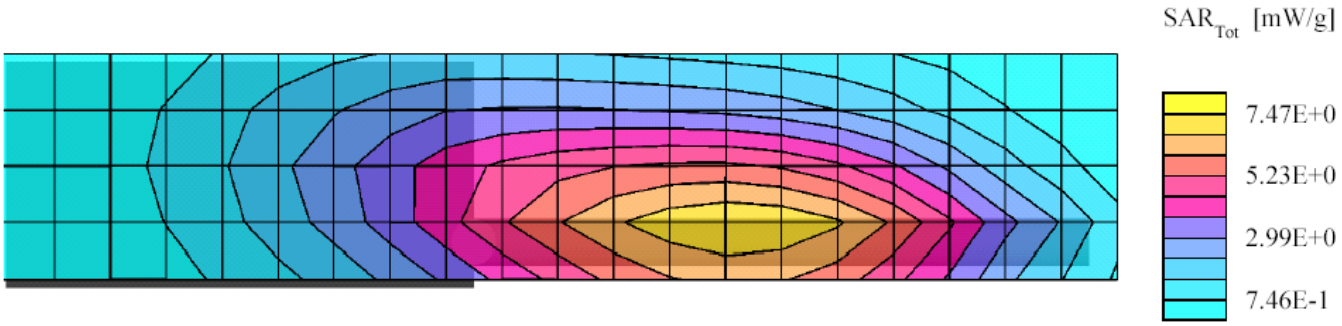


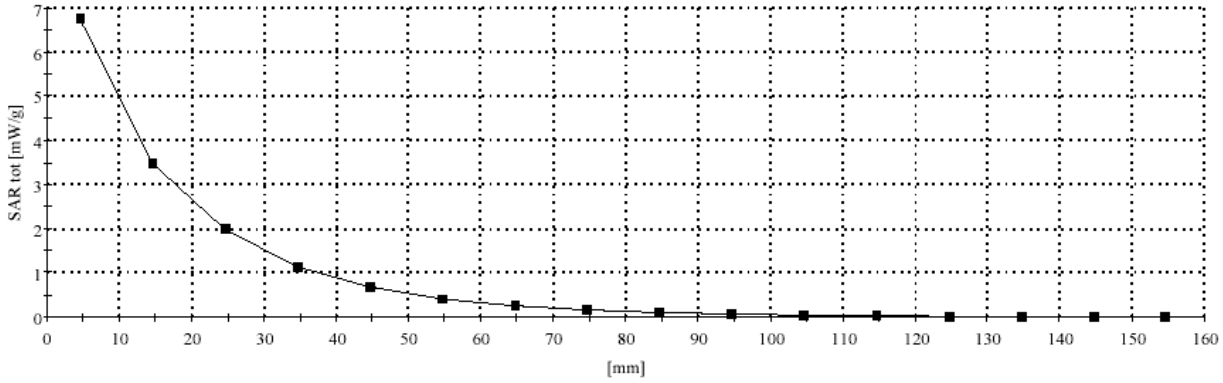


FCC ID: ABZ99FT4056; Test Date: 09/20/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020920-09
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 470 MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4496A
Carry: chest pak HLN6602A
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.10,7.10,7.10); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_454MHz: σ = 0.91 mho/m ε = 55.0 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 7.08 mW/g, SAR (10g): 4.98 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 49.5, 199.5, 4.7

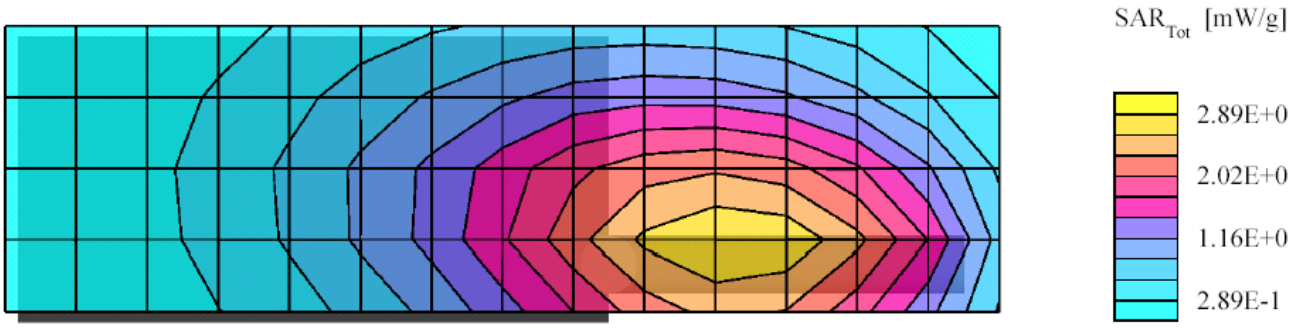


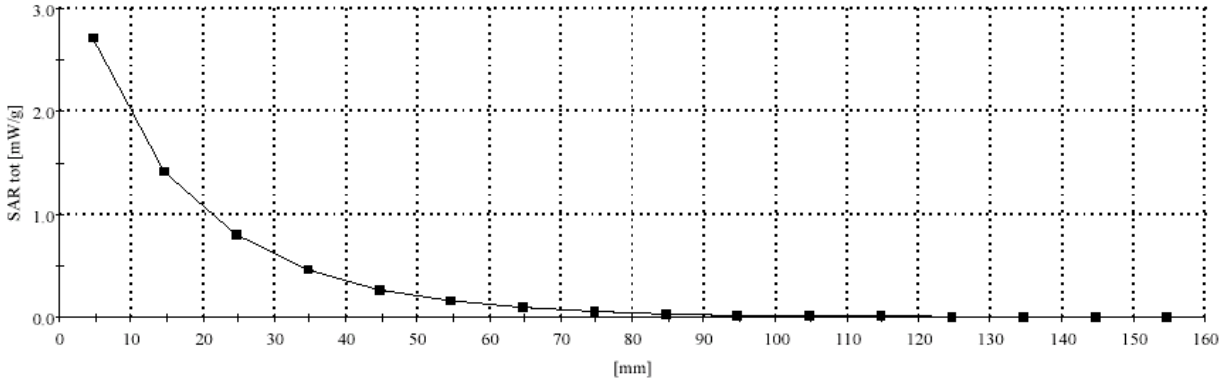


FCC ID: ABZ99FT4056; Test Date: 09/20/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020920-11
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 438 MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna:8505816K25
Battery Kit: NNTN4496A
Carry: chest pak HLN6602A
Audio Acc. HMN9030A RSM

DUT against the flat phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.10,7.10,7.10); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_454MHz: σ = 0.91 mho/m ε = 55.0 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 2.79 mW/g, SAR (10g): 1.97 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 48.0, 156.0, 4.7



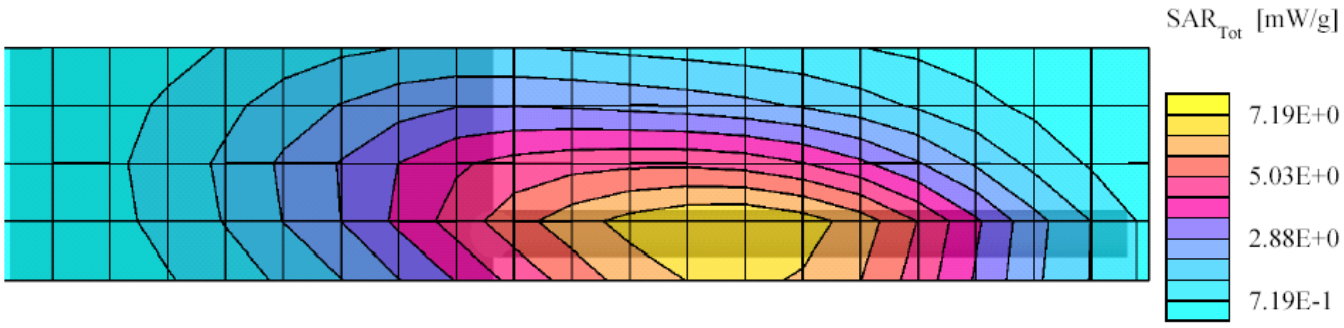


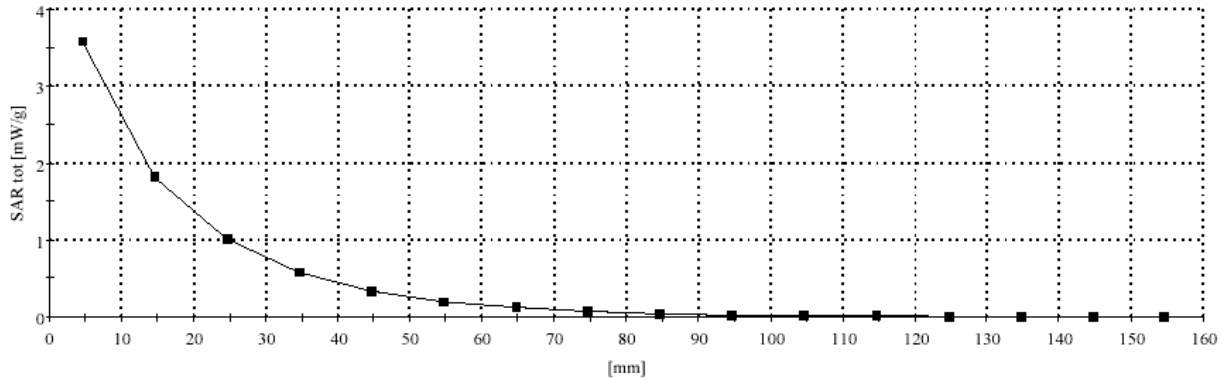
FCC ID: ABZ99FT4056; Test Date: 09/30/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-020930-05
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 470 MHz
Sim Tissue Temp: 21.6 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4496A
Carry: chest pak HLN6602A
Audio Acc. RLN5411A headset

DUT against the flat phantom

Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.10,7.10,7.10); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_454MHz: σ = 0.93 mho/m ε = 54.5 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 6.80 mW/g, SAR (10g): 4.63 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 51.0, 193.5, 4.7

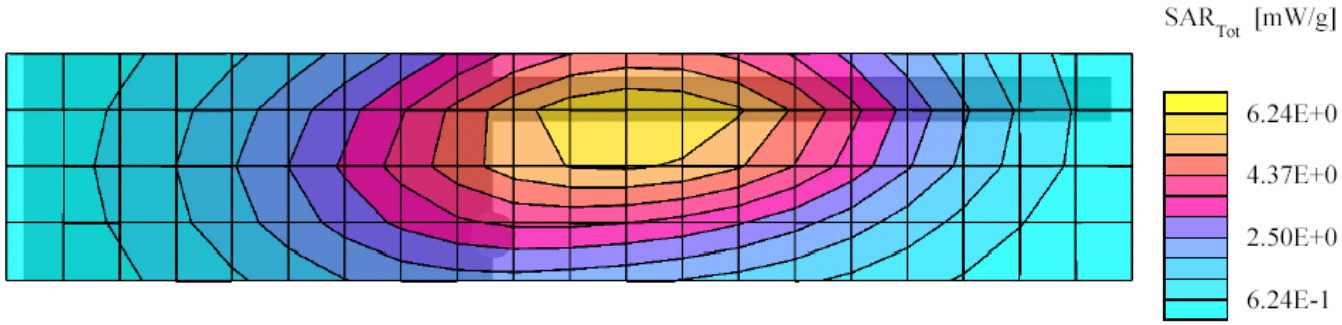


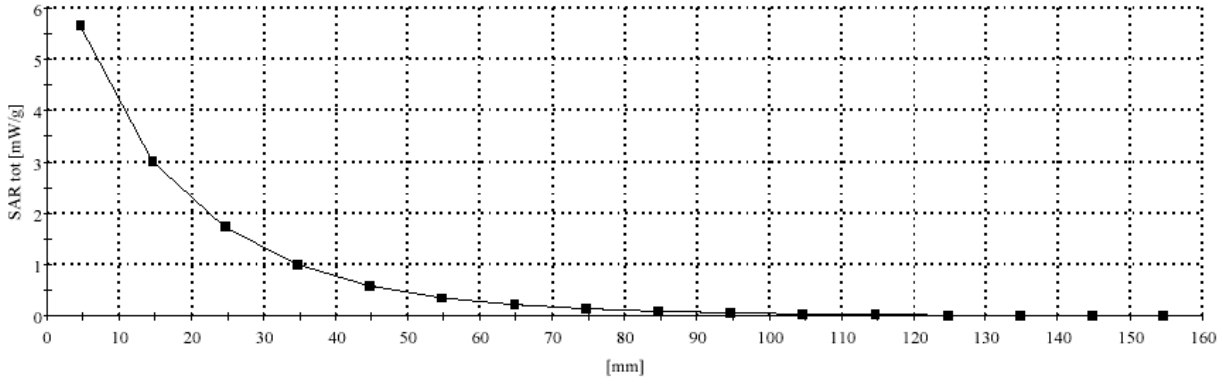


FCC ID: ABZ99FT4056; Test Date: 10/02/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021002-03
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 470 MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4496A
Carry: front of radio with antenna @ 2.5cm
Audio Acc. RLN5411A headset

DUT antenna 2.5 cm separation from phantom
Flat Phantom Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.10,7.10,7.10); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_454MHz: σ = 0.91 mho/m ε = 54.0 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 5.94 mW/g, SAR (10g): 4.25 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 18.0, 166.5, 4.7

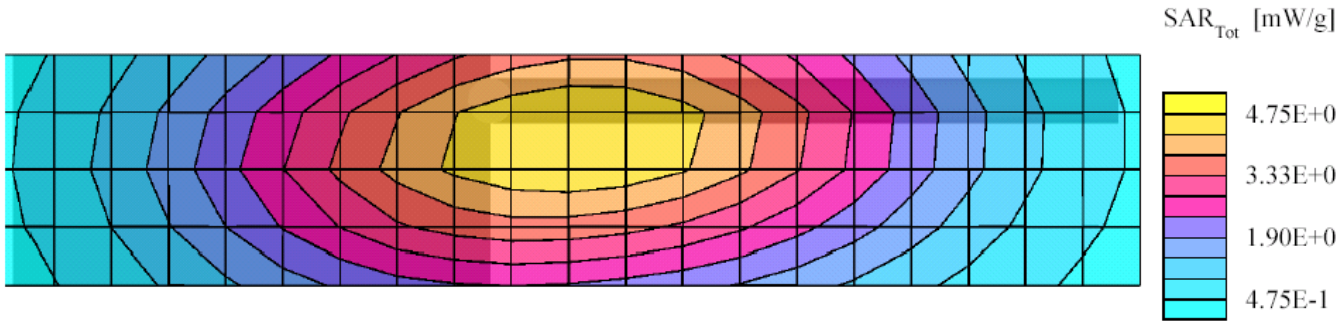


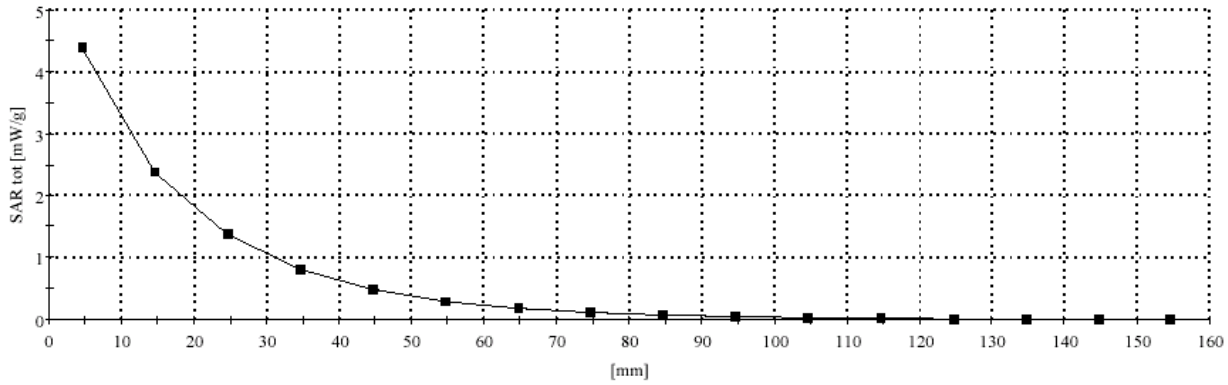


FCC ID: ABZ99FT3045; Test Date: 10/03/02
Motorola CGISS EME Laboratory
Run #: Face-R1-021003-05
Model #: AAH50RDC9AA2AN SN:WDEXF3WQ
TX Freq: 438 MHz
Sim Tissue Temp: 21.0 (Celsius)

- Accessories -
Antenna:NAE6483A
Battery Kit: NNTN4497A
Carry: none
Audio Acc. none

DUT Mic @ 2.5cm from phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(7.00,7.00,7.00); Probe cal date: 21/05/02; Crest factor: 1.0; IEEE Head_454MHz: σ = 0.90 mho/m ε = 43.1 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 4.48 mW/g, SAR (10g): 3.26 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 22.5, 153.0, 4.7





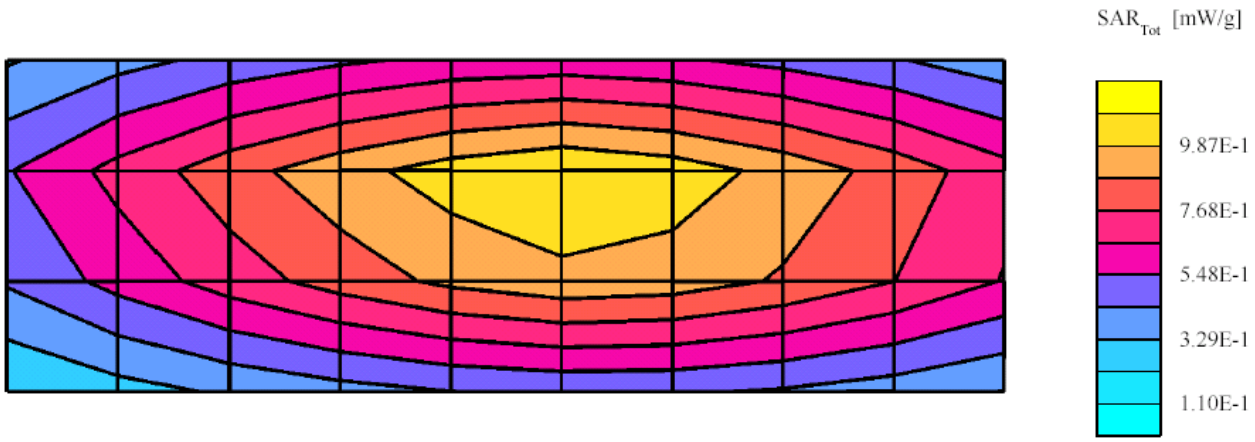
APPENDIX C

Dipole System Performance Check Results

CGISS 450 MHz Dipole; SN-002; Test Date:09/18/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020918-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.2 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.70 mW/g, Percent from target (including drift) for 1g is 2.4%

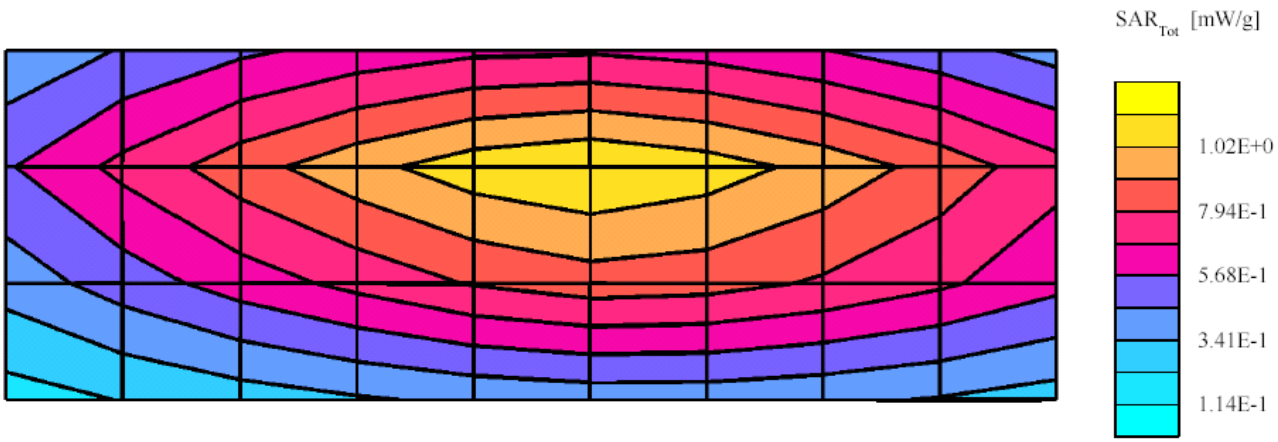
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.93 mho/m ε = 55.8 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.81 mW/g ± 0.05 dB, SAR (1g): 1.16 mW/g ± 0.05 dB, SAR (10g): 0.768 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.3, 14.5) [mm]
Power drift: -0.06 dB



CGISS 450 MHz Dipole; SN-002; Test Date:09/19/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020919-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.2 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.65 mW/g, Percent from target (including drift) for 1g is 3.5%

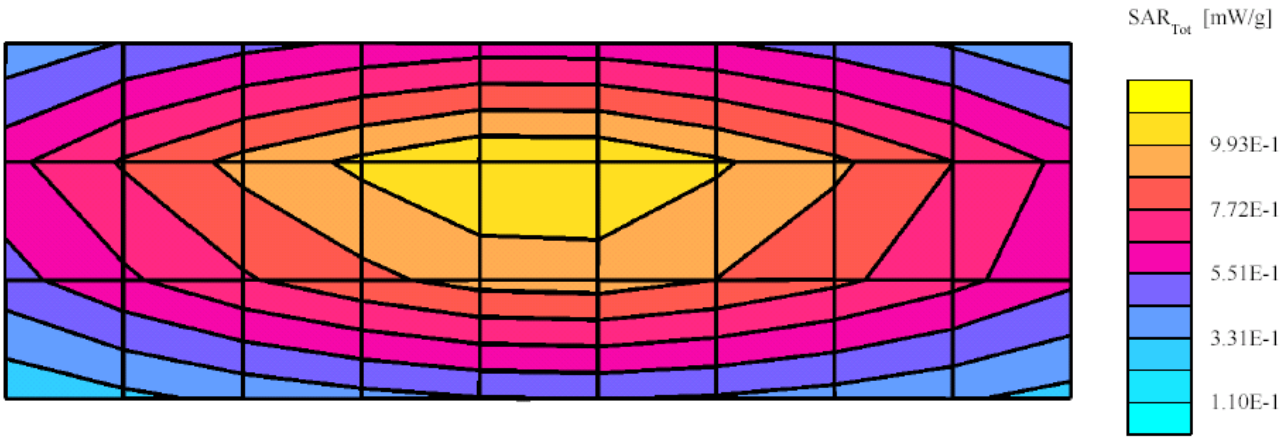
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.90 mho/m ε = 54.8 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.80 mW/g ± 0.09 dB, SAR (1g): 1.16 mW/g ± 0.07 dB, SAR (10g): 0.764 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.3, 14.4) [mm]
Power drift: -0.01 dB



CGISS 300MHz Dipole; SN-002; Test Date:09/20/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020920-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.71 mW/g, Percent from target (including drift) for 1g is 2.2%

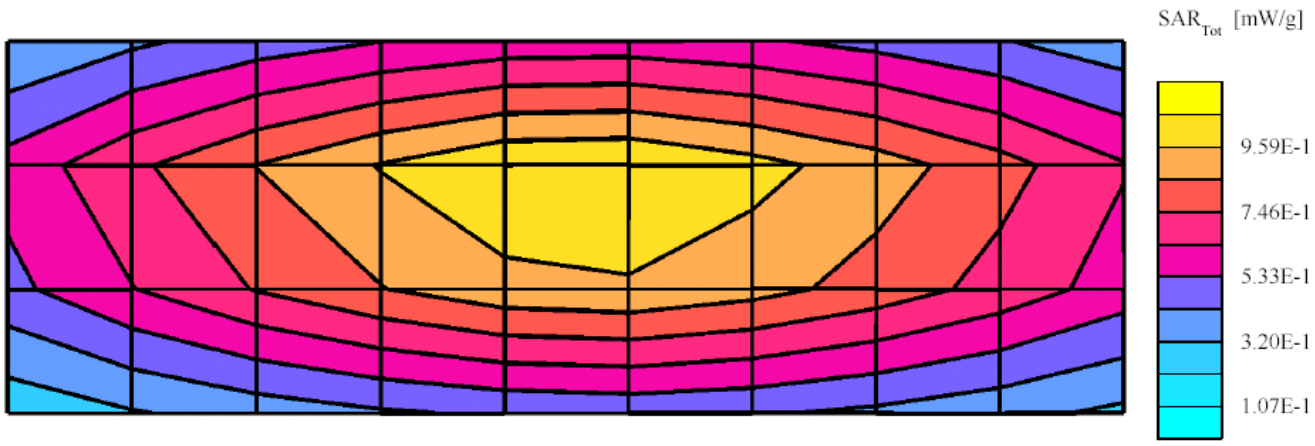
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.91 mho/m ε = 55.1 ρ= 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.82 mW/g ± 0.05 dB, SAR (1g): 1.17 mW/g ± 0.06 dB, SAR (10g): 0.771 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.2, 14.6) [mm]
Power drift: -0.03 dB



CGISS 450MHz Dipole; SN-002; Test Date:09/23/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020923-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.65 mW/g, Percent from target (including drift) for 1g is 3.5%

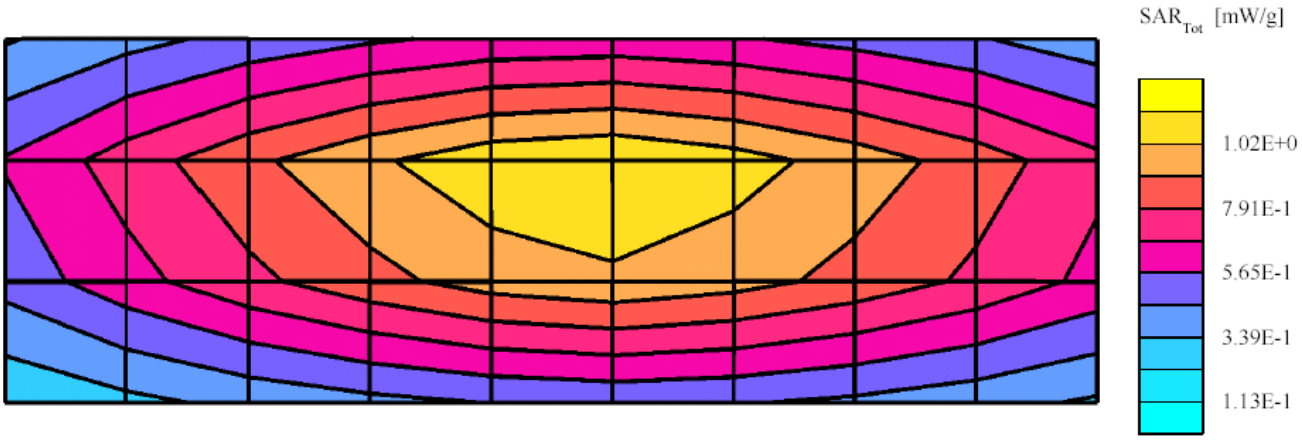
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.90 mho/m ε = 54.6 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.77 mW/g ± 0.05 dB, SAR (1g): 1.15 mW/g ± 0.06 dB, SAR (10g): 0.758 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.8 (11.4, 14.7) [mm]
Power drift: -0.01 dB



CGISS 450 MHz Dipole; SN-002; Test Date:09/30/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-020930-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.6 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.82 mW/g, Percent from target (including drift) for 1g is 0.0%

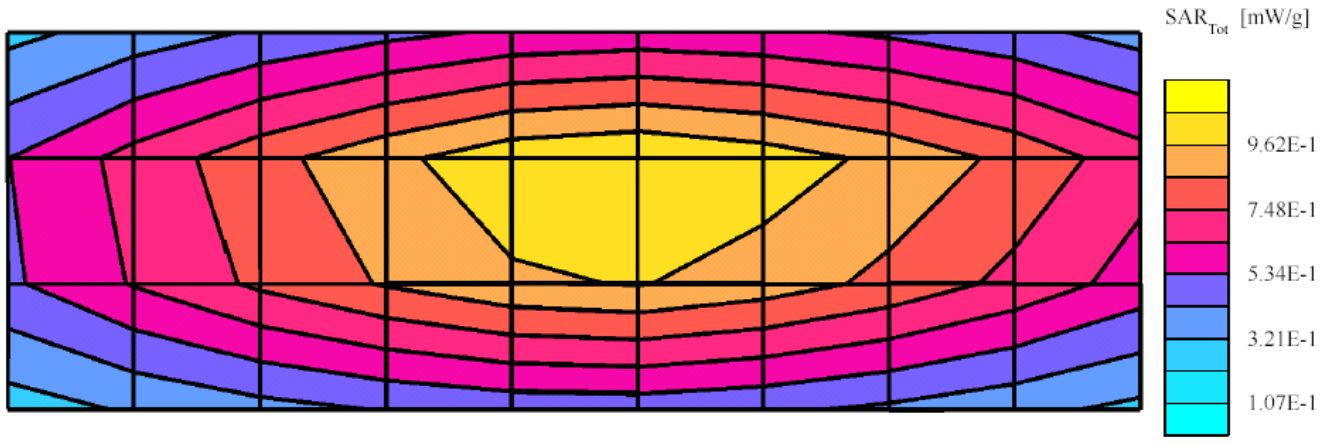
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.93 mho/m ε = 54.6 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.86 mW/g ± 0.06 dB, SAR (1g): 1.20 mW/g ± 0.06 dB, SAR (10g): 0.793 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.3, 14.6) [mm]
Power drift: -0.02 dB



CGISS 450 MHz Dipole; SN-002; Test Date:10/01/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021001-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.63 mW/g, Percent from target (including drift) for 1g is 3.9%

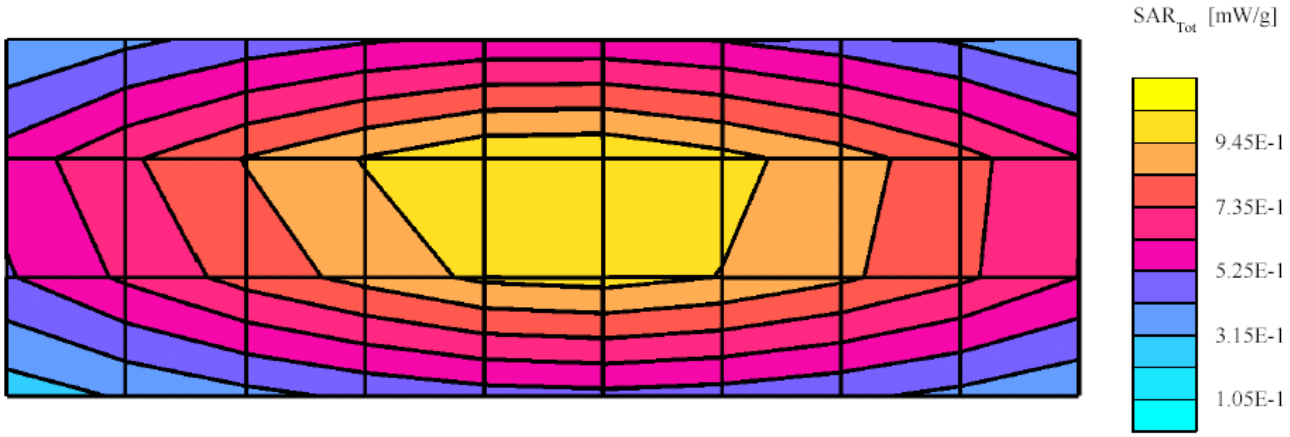
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.91 mho/m ε = 54.2 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.78 mW/g ± 0.04 dB, SAR (1g): 1.15 mW/g ± 0.05 dB, SAR (10g): 0.763 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.8 (11.3, 14.7) [mm]
Power drift: -0.03 dB



CGISS 450 MHz Dipole; SN-002; Test Date:10/02/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021002-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.82 mW/g (including drift) (1g)
SAR calculated is 4.65 mW/g, Percent from target (including drift) for 1g is 3.5%

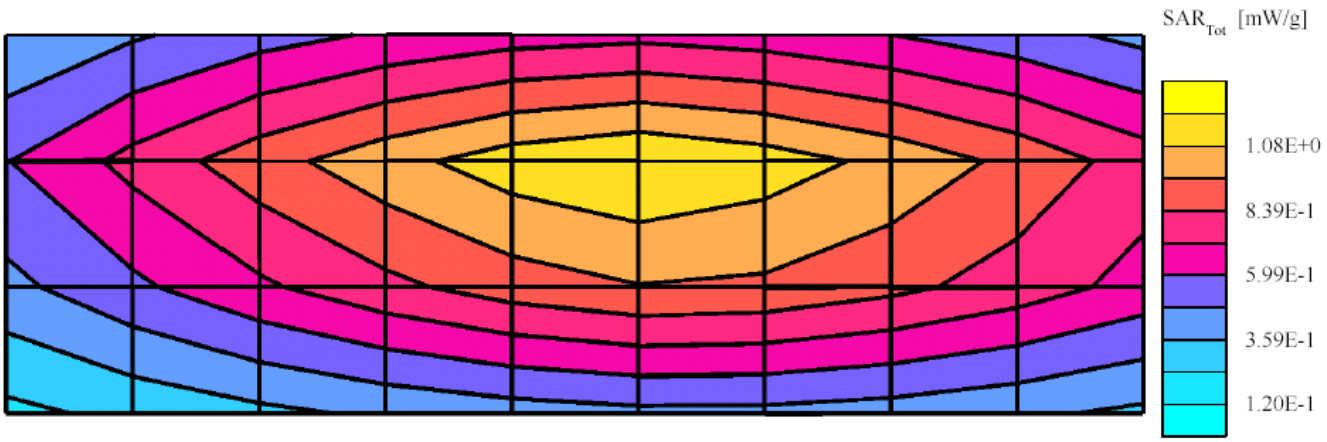
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.10,7.10,7.10); Crest factor: 1.0; FCC Body_450 MHz: σ = 0.91 mho/m ε= 54.1 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.79 mW/g ± 0.07 dB, SAR (1g): 1.16 mW/g ± 0.07 dB, SAR (10g): 0.767 mW/g ± 0.07 dB, (Worst-case extrapolation) Penetration depth: 12.8 (11.4, 14.7) [mm]
Power drift: -0.01 dB



CGISS 450 MHz Dipole; SN-002; Test Date:10/03/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021003-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.79 mW/g (including drift) (1g)
SAR calculated is 4.95 mW/g, Percent from target (including drift) for 1g is 3.4%

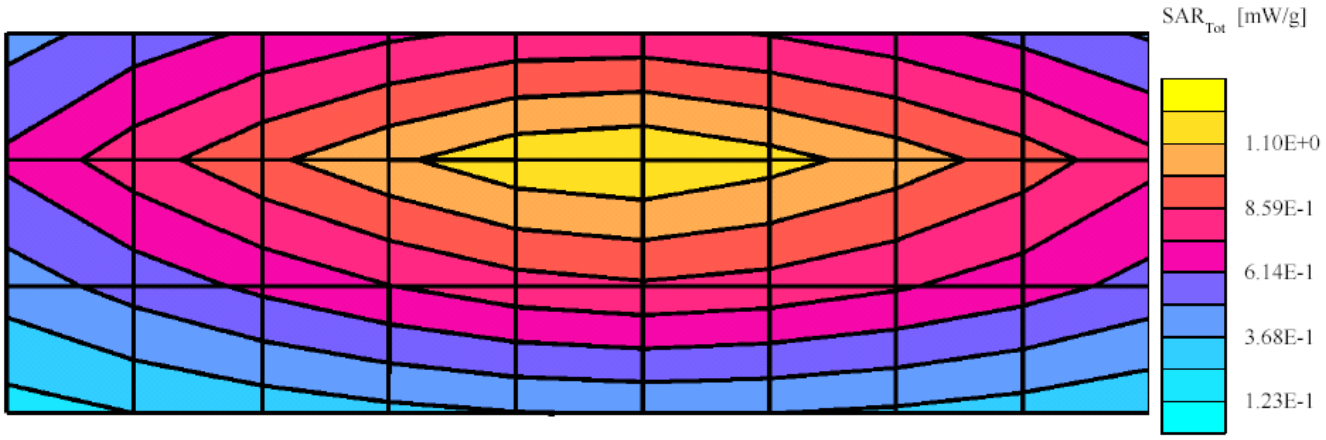
Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head_450MHz: σ = 0.90 mho/m ε = 43.1 ρ= 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.92 mW/g ± 0.08 dB, SAR (1g): 1.23 mW/g ± 0.07 dB, SAR (10g): 0.808 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.2, 14.1) [mm]
Power drift: -0.03 dB



CGISS 450 MHz Dipole; SN-002; Test Date:10/04/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021004-01
TX Freq: 450 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

- Comments-
Target at 1W is 4.79 mW/g (including drift) (1g)
SAR calculated is 4.98 mW/g, Percent from target (including drift) for 1g is 4.0%

Flat Phantom; Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(7.00,7.00,7.00); Crest factor: 1.0; IEEE Head_450MHz: σ = 0.88 mho/m ε = 42.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 1.94 mW/g ± 0.07 dB, SAR (1g): 1.24 mW/g ± 0.07 dB, SAR (10g): 0.805 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.3 (11.0, 14.0) [mm]
Power drift: -0.02 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	3/11/02	Frequency (MHz):	450
Lab Location:	CGISS	Mixture Type:	Body
Robot System:	Robot #3	Ambient Temp.(°C):	21
Probe Serial #:	1384	Tissue Temp.(°C):	21.4
DAE Serial #:	406		

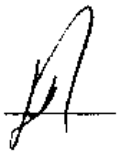
Tissue Characteristics		Phantom Type/SN:	80602002C
Permitivity:	56.7	Distance (mm):	15
Conductivity:	0.93		

Reference Source: MFRL Dipole (Dipole)
Reference SN: 450-002

Power to Dipole: 250 mW

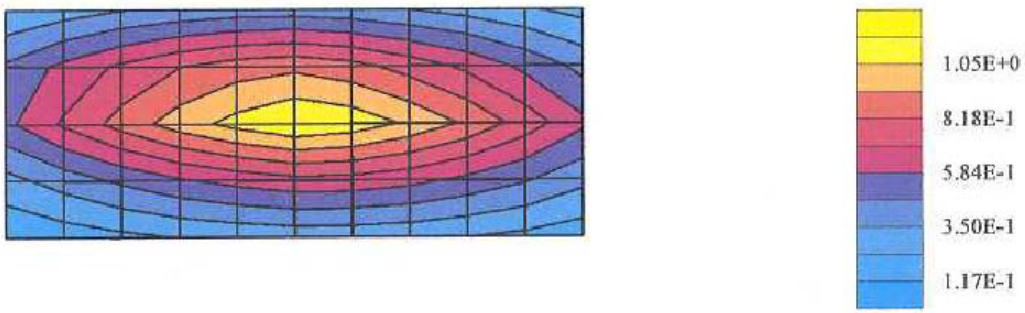
Measured SAR Value: 1.18 mW/g, 0.771 mW/g (10g avg.)
Power Drift: -0.09 dB

New Target/Measured SAR Value: (normalized to 1.0 W, with drift compensation) 4.82 mW/g, 3.15 mW/g (10g avg.)

Test performed by: Jim Fortier Initial: 

Dipole 450MHz SN002; Test date:03/11/02

Run #: R3-02031103 Phantom #: 80602002C
Model Dipole MFRL SN:450-002
Robot #: CGISS-3 Tester: Jim Fortier
Tx Freq: 450 MHz Simulated Tissue Temp: 21.4C Ambient:21C
Start Power: 250 mW System Performance Target (1W): 4.82 mW/g
Flat; Probe: ET3DV6 - SN1384; ConvF(7.45,7.45,7.45); Crest factor: 1.0; FCC Body 450: σ = 0.93 mho/m ε_r = 56.7 ρ = 1.00 g/cm^3
Cube 7x7x7: Peak: 1.85 mW/g, SAR (1g): 1.18 mW/g, SAR (10g): 0.771 mW/g, (Worst-case extrapolation)
Penetration depth: 12.5 (11.1, 14.4) [mm]
Powerdrift: -0.09 dB



Motorola CGISS EME Lab

SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	3/11/02	Frequency (MHz):	450
Lab Location:	CGISS	Mixture Type:	Head
Robot System:	Robot #3	Ambient Temp.(°C):	21
Probe Serial #:	1384	Tissue Temp.(°C):	20.9
DAE Serial #:	406		

Tissue Characteristics		Phantom Type/SN:	ACL40232002B
Permitivity:	43.1	Distance (mm):	15
Conductivity:	0.85		

Reference Source: MFRL Dipole (Dipole)
Reference SN: 450-002

Power to Dipole: 250 mW

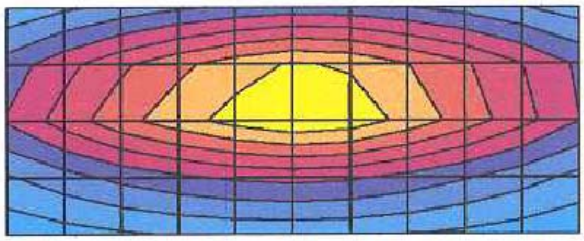
Measured SAR Value: 1.17 mW/g, 0.764 mW/g (10g avg.)
Power Drift: -0.1 dB

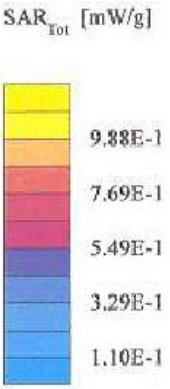
New Target/Measured SAR Value: (normalized to 1.0 W, with drift compensation) 4.79 mW/g, 3.13 mW/g (10g avg.)

Test performed by: Jim Fortier Initial: 

Dipole 450MHz SN002; Test date:03/11/02

Run #: R3-02031102 Phantom #: ACL40232002B
Model Dipole MFRL SN:450-002
Robot #: CGISS-3 Tester: Jim Fortier
Tx Freq: 450 MHz Simulated Tissue Temp: 20.9C Ambient:21C
Start Power: 250 mW System Performance Target (1W): 4.79 mW/g
Flat; Probe: ET3DV6 - SN1384; ConvF(7.57,7.57,7.57); Crest factor: 1.0; IEEE Head 450 MHz: σ = 0.85 mho/m ε_r = 43.1 ρ = 1.00 g/cm^3
Cube 7x7x7: Peak: 1.84 mW/g, SAR (1g): 1.17 mW/g, SAR (10g): 0.764 mW/g, (Worst-case extrapolation)
Penetration depth: 12.3 (10.9, 14.1) [mm]
Powerdrift: -0.10 dB





Motorola CGISS EME Lab

SYSTEM VALIDATION

Date:	3/11/02	Frequency (MHz):	835
Lab Location:	CGISS	Mixture Type:	Head
Robot System:	Robot #3	Ambient Temp.(°C):	21
Probe Serial #:	1384	Tissue Temp.(°C):	21.3
DAE Serial #:	406		

Tissue Characteristics		Phantom Type/SN:	SAMTP1022
Permitivity:	40.3	Distance (mm):	15
Conductivity:	0.90		

Reference Source: D835 V2 (Dipole)
Reference SN: 436

Power to Dipole: 250 mW
Power Output (radio): N/A mW

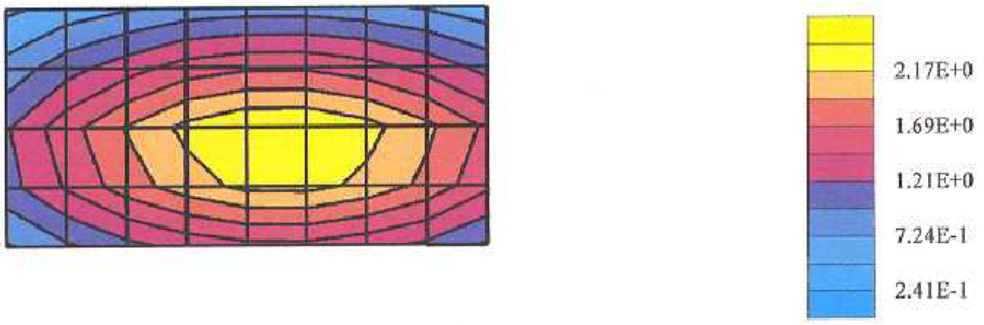
Target SAR Value: (normalized to 1.0 W)	10.2 mW/g,	6.56 mW/g (10g avg.)
Measured SAR Value:	2.47 mW/g,	1.58 mW/g (10g avg.)
Power Drift:	-0.02 dB	
Measured SAR Value: (normalized to 1.0 W, with drift compensation)	9.93 mW/g,	6.35 mW/g (10g avg.)

Percent Difference From Target (must be within System Uncertainty): 2.6 % (1g avg)
3.2 % (10g avg)

Test performed by: ___Jim Fortier_____ Initial: 

Dipole D835V2 SN426; Test date:03/11/02

Run #: R3-02031101 Phantom #: SAMTP1022
Model SPEAG Dipole D835V2 SN426
Robot #: CGISS-3 Tester: Jim Fortier
Tx Freq: 835 MHz Simulated Tissue Temp: 21.3C Ambient:21C
Start Power: 250 mW SPEAG Validation Target (1W): 10.2 mW/g
Flat; Probe: ET3DV6 - SN1384; ConvF(6.57,6.57,6.57); Crest factor: 1.0; IEEE HEAD 835MHz: σ = 0.90 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3
Cube 7x7x7: Peak: 3.87 mW/g, SAR (1g): 2.47 mW/g, SAR (10g): 1.58 mW/g, (Worst-case extrapolation)
Penetration depth: 11.9 (11.0, 13.2) [mm]
Powerdrift: -0.02 dB



Motorola CGISS EME Lab

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:	ET3DV6R
Serial Number:	1545
Place of Calibration:	Zurich
Date of Calibration:	May 21, 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:	D. Vetter
Approved by:	Katja Pokovic

DASY3 - Parameters of Probe: ET3DV6R SN:1545

Sensitivity in Free Space

NormX	2.04 $\mu V/(V/m)^2$
NormY	2.11 $\mu V/(V/m)^2$
NormZ	1.79 $\mu V/(V/m)^2$

Diode Compression

DCP X	95	mV
DCP Y	95	mV
DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid

Head	**900 MHz**	ε_r = 41.5 ± 5%	σ = 0.97 ± 5% mho/m
Head	**835 MHz**	ε_r = 41.5 ± 5%	σ = 0.90 ± 5% mho/m

ConvF X	6.1 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.1 ± 9.5% (k=2)	Alpha	0.40
ConvF Z	6.1 ± 9.5% (k=2)	Depth	2.47

Head	**1800 MHz**	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m
Head	**1900 MHz**	ε_r = 40.0 ± 5%	σ = 1.40 ± 5% mho/m

ConvF X	5.0 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.0 ± 9.5% (k=2)	Alpha	0.57
ConvF Z	5.0 ± 9.5% (k=2)	Depth	2.25

Boundary Effect

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	10.3	5.8
SAR_{be} [%]	With Correction Algorithm	0.4	0.5

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	12.3	7.9
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

Probe Tip to Sensor Center	2.7	mm

Schmid & Partner
Engineering AG

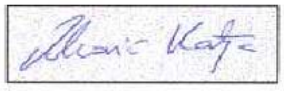
Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6R**
Serial Number:	**1545**
Place of Assessment:	**Zurich**
Date of Assessment:	**May 23, 2002**
Probe Calibration Date:	**May 21, 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 ET3DV6R SN:1545

Conversion factor (± standard deviation)

150 MHz	ConvF	**7.8 ± 8%**	ε_r = **61.9** ±5% σ = **0.80** ±5% **mho/m** (body tissue)
236 MHz	ConvF	**7.6 ± 8%**	ε_r = **59.8** ±5% σ = **0.87** ±5% **mho/m** (body tissue)
300 MHz	ConvF	**7.5 ± 8%**	ε_r = **58.2** ±5% σ = **0.92** ±5% **mho/m** (body tissue)
350 MHz	ConvF	**7.3 ± 8%**	ε_r = **57.7** ±5% σ = **0.93** ±5% **mho/m** (body tissue)
450 MHz	ConvF	**7.1 ± 8%**	ε_r = **56.7** ±5% σ = **0.94** ±5% **mho/m** (body tissue)
784 MHz	ConvF	**6.1 ± 8%**	ε_r = **55.4** ±5% σ = **0.97** ±5% **mho/m** (body tissue)
835 MHz	ConvF	**6.0 ± 8%**	ε_r = **55.2** ±5% σ = **0.97** ±5% **mho/m** (body tissue)
925 MHz	ConvF	**5.9 ± 8%**	ε_r = **55.0** ±5% σ = **1.06** ±5% **mho/m** (body tissue)
1450 MHz	ConvF	**5.1 ± 8%**	ε_r = **54.0** ±5% σ = **1.30** ±5% **mho/m** (body tissue)
1900 MHz	ConvF	**4.4 ± 8%**	ε_r = **53.3** ±5% σ = **1.52** ±5% **mho/m** (body tissue)
2450 MHz	ConvF	**3.7 ± 8%**	ε_r = **52.7** ±5% σ = **1.95** ±5% **mho/m** (body tissue)

Dosimetric E-Field Probe ET3DV6R SN:1545

Conversion factor (± standard deviation)

150 MHz	ConvF	**8.5 ± 8%**	ε_r = 52.3 ±5% σ = 0.76 ±5% mho/m (head tissue)
236 MHz	ConvF	**7.7 ± 8%**	ε_r = 48.3 ±5% σ = 0.82 ±5% mho/m (head tissue)
300 MHz	ConvF	**7.3 ± 8%**	ε_r = 45.3 ±5% σ = 0.87 ±5% mho/m (head tissue)
350 MHz	ConvF	**7.2 ± 8%**	ε_r = 44.7 ±5% σ = 0.87 ±5% mho/m (head tissue)
400 MHz	ConvF	**7.1 ± 8%**	ε_r = 44.4 ±5% σ = 0.87 ±5% mho/m (head tissue - CENELEC)
450 MHz	ConvF	**7.0 ± 8%**	ε_r = 43.5 ±5% σ = 0.87 ±5% mho/m (head tissue)
784 MHz	ConvF	**6.3 ± 8%**	ε_r = 41.8 ±5% σ = 0.90 ±5% mho/m (head tissue)
835 MHz	ConvF	**6.2 ± 8%**	ε_r = 41.5 ±5% σ = 0.90 ±5% mho/m (head tissue)
835 MHz	ConvF	**6.2 ± 8%**	ε_r = 42.5 ±5% σ = 0.98 ±5% mho/m (head tissue - CENELEC)
925 MHz	ConvF	**6.1 ± 8%**	ε_r = 41.5 ±5% σ = 0.98 ±5% mho/m (head tissue)
900 MHz	ConvF	**6.1 ± 8%**	ε_r = 42.3 ±5% σ = 0.99 ±5% mho/m (head tissue - CENELEC)

Dosimetric E-Field Probe ET3DV6R SN:1545

Conversion factor (± standard deviation)

1500 MHz	ConvF	**5.4 ± 8%**	ε_r = **40.4** σ = **1.23 mho/m** (head tissue)
1900 MHz	ConvF	**4.8 ± 8%**	ε_r = **40.0 ±5%** σ = **1.40 ±5% mho/m** (head tissue)
2450 MHz	ConvF	**4.1 ± 8%**	ε_r = **39.2 ±5%** σ = **1.80 ±5% mho/m** (head tissue)

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

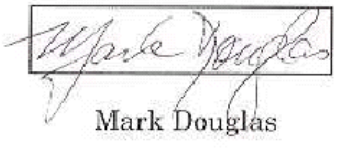
Frequency:	*450*	***MHz***
Dipole Serial Number:	*450-002*	
Simulated Tissue:	*body*	
Date of Validation:	*August 9, 2001*	
Validation Interval:	*24 months*	

Motorola Florida Research Laboratory hereby certifies, that the System Validation was performed on the date indicated above. The System Validation was performed in accordance with specifications and procedures of Motorola Florida Research Laboratory.

Calibrated by:

J. Patrick Oliver

Approved by:



Mark Douglas

Motorola Florida Research Laboratory - 8000 West Sunrise Blvd. Ft. Lauderdale, Florida 33322

Purpose:

To provide a method to check the validity of the SAR measurement system prior to testing

Tissue Simulate:

Name:	*Body 450*	
Targets for tissue characteristics:		
Dielectric Constant:	*56.7*	+/- 5%
Conductivity:	*0.94 S/m*	+/- 5%
Measurement values:		
Dielectric Constant:	*57.9*	
Conductivity:	*0.94*	

Validation setup:

Set up for the validation using constant forward power as shown in Figure 1. The total distance from the simulated tissue to the top of the dipole elements is 16 mm.

Use 1.0 for the density of the simulated tissue.

Target for SAR validation:

The target is specified in terms of peak SAR averaged over 1 cm^3 (1 gram) of tissue.

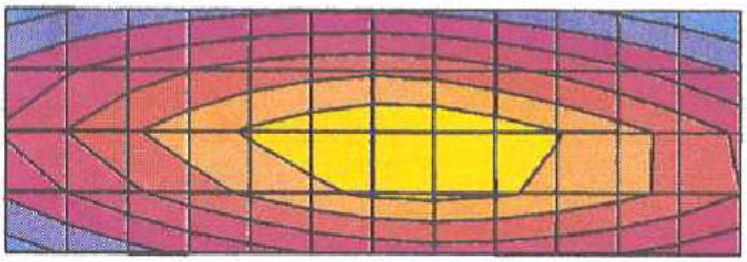
The target is normalized to 1 watt based on a constant forward input power of 500 mW.

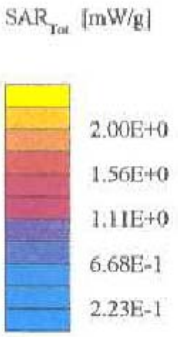
Peak SAR, at 1 watt, averaged over 1 cm^3 (1 gram) of tissue:

4.4 mW/g	+/- 10%

dipole 450; Test Date:08/10/01

dipole 450-002, body, 500 mW constant forward power
9x16 inch flat Phantom; Section; Position: ;
Probe: - SN1418; ConvF(6.74,6.74,6.74); Crest factor: 1.0; Muscle 450 MHz: σ = 0.94 mho/m ε_r = 57.9 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 2.22 mW/g ± 0.01 dB, SAR (10g): 1.49 mW/g ± 0.01 dB, (Worst-case extrapolation), Peak: 3.38 mW/g ± 0.01 dB,Max at 67.0, 17.0, 4.5
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0
Powerdrift: -0.07 dB





Motorola Florida Research Lab

MOTOROLA

DIPOLE SAR VALIDATION CERTIFICATE

Frequency:	*450*	***MHz***
Dipole Serial Number:	*450-002*	
Simulated Tissue:	*head*	
Date of Validation:	*August 11, 2001*	
Validation Interval:	*24 months*	

Motorola Florida Research Laboratory hereby certifies, that the System Validation was performed on the date indicated above. The System Validation was performed in accordance with specifications and procedures of Motorola Florida Research Laboratory.

Calibrated by: J. Patrick Oliver

Approved by: Mark Douglas

Motorola Florida Research Laboratory - 8000 West Sunrise Blvd. Ft. Lauderdale, Florida 33322

Purpose:

To provide a method to check the validity of the SAR measurement system prior to testing

Tissue Simulate:

Name:	*Head 450*	
Targets for tissue characteristics:		
Dielectric Constant:	*43.5*	+/- 5%
Conductivity:	*0.87 S/m*	+/- 5%
Measurement values:		
Dielectric Constant:	*43.5*	
Conductivity:	*0.87*	

Validation setup:

Set up for the validation using constant forward power as shown in Figure 1. The total distance from the mixture to the top of the dipole tips is 16 mm.

Use 1.0 for the density of the simulated tissue.

Target for SAR validation:

The target is specified in terms of peak SAR averaged over 1 cm^3 (1 gram) of tissue.

The target is normalized to 1 watt based on a constant forward input power of 500 mW.

Peak SAR, at 1 watt, averaged over 1 cm^3 (1 gram) of tissue:

4.4 mW/g	+/- 10%

dipole 450; Test Date:08/13/01

dipole 450-002, head. forward power = 500 mW

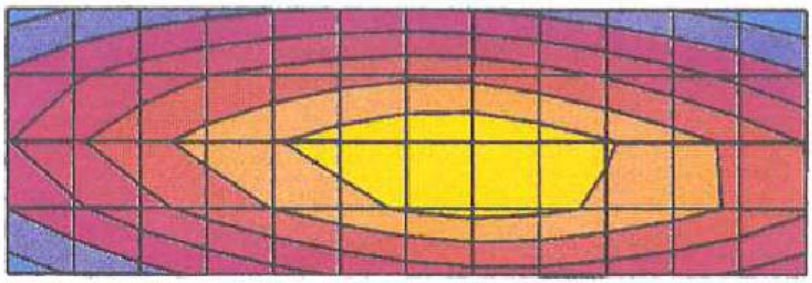
9x16 inch flat Phantom; Section; Position: ;

Probe: - SN1418; ConvF(6.81,6.81,6.81); Crest factor: 1.0; head450: σ = 0.88 mho/m ε_r = 43.2 ρ = 1.00 g/cm^3

Cubes (2): SAR (1g): 2.22 mW/g ± 0.08 dB, SAR (10g): 1.47 mW/g ± 0.09 dB, (Worst-case extrapolation), Peak: 3.44 mW/g ± 0.07 dB,Max at 69.0, 17.0, 4.5

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Powerdrift: 44.57 dB



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APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: ABZ99FT4056. The sample that was used in the following photos represents the product used to obtain the results presented herein and was used in section to demonstrate the different body-worn accessories.

Photo 1.
Model HLN8255A
Back View

Photo 2.
Model HLN8255A
Side View

Photo 3.
Model PMLN4124A
Back View

Photo 4.
Model PMLN4124A
Side View

Photo 5.
Model HLN9701B
Back View

Photo 6.
Model HLN9701B
Front View

Photo 7.
Model HLN9701B
Side View

Photo 8.
Model RLN5383A
Back View

Photo 9.
Model RLN5383A
Front View

Photo 10.
Model RLN5383A
Side View

Photo 11.
Model RLN5384A
Back View

Photo 12.
Model RLN5384A
Front View

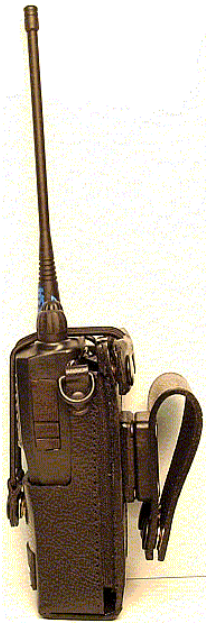

Photo 13.
Model RLN5384A
Side View

Photo 14.
Model RLN5385A
Back View

Photo 15.
Model RLN5385A
Front View

Photo 16.
Model RLN5385A
Side View

Photo 17.
RLN4815A
Universal Radio Pack

Photo 18.
HLN6602A
Universal Chest Pack

Photo 19.
NTN5243A
Shoulder Carry Strap

Appendix F
Accessories and options test status and separation distances

The following table summarizes the body spacing distance provided by each of the body-worn accessories:

Carry Case Model	Tested ?	Separation distance between device and phantom surface. (mm)	Comments
HLN6602A	Yes	26	NA
1505596Z02	No	-	No metallic parts
RLN4570A	No	26	Similar to HLN6602A
RLN4815A	Yes	45	NA
4280384F89	No	-	No metallic parts
NTN5243A	Yes	50	Tested with carry case
PMLN4124A	Yes	39	NA
HLN8255B	Yes	38	NA
HLN9701B	Yes	45	NA
RLN5383A	Yes	50	NA
RLN5384A	No	62	Similar to RLN5385A
RLN5385A	Yes	62	NA
Audio Acc. Model	**Tested ?**	**Separation distance between device and phantom surface. (mm)**	**Comments**
HMN9030A	Yes	NA	NA
HMN9727B	No	NA	Receive only
RLN4894A	No	NA	Receive only
HMN9752B	No	NA	Receive only
HMN9754D	Yes	NA	NA
RLN4895A	No	NA	Similar to HMN9754D
HMN9036A	No	NA	Similar to HMN9754D
HLN9132A	No	NA	Receive only
RLN5198AP	No	NA	Similar to HMN9754D
BDN6720A	No	NA	Receive only
PMMN4001A	Yes	NA	NA
HMN9013A	Yes	NA	NA
RMN4016A	Yes	NA	NA
RLN5238A	Yes	NA	NA
HMN9021A	Yes	NA	NA
HMN9022A	No	NA	Similar HMN9021A
BDN6647F	Yes	NA	NA
BDN6648C	Yes	NA	NA
RMN5015A	Yes	NA	NA
RKN4090A	Yes	NA	tested with RMN5015A
RLN5411A	Yes	NA	NA