Certificate Number: 1449-02

MOTOROLA

ACCREDITED

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

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

Attention:	FCC
Date of Report:	June 4, 2003
Report Revision:	Rev. A
Manufacturer:	Motorola South - ARAD
Product Description:	Data Terminal w/ 1.8W Data TAC: FDMA, 4-level FSK modulation; 1mW Bluetooth: Frequency Hopping Spread Spectrum (FHSS)
FCC ID:	**AZ489FT7004**
Device Model:	F4415A (VA00052AA)

Test Period:	11/27/02 – 12/05/02
Test Engineer:	Stephen Whalen (Sr. EME 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.

Signature on file — 6/5/03

Ken Enger — Date Approved
Senior Resource Manager, Laboratory Director, CGISS EME Lab

APPENDIX A

Power Slump Data/Shortened Scan

DUT Power versus time data (FNN5105A battery)

HDT600 with WaveNet and Bluetooth
Power Measurements for EME
Model F4415A

Initial Power Measurements RDLAP19200 S/N 296SCQ0268 DataTAC LLI 800700C1			RDLAP19200 Power Slump @ 813.5 MHz (Ch. 600)		
Frequency (MHz)	Power (W)	Power (dBm)	Time (min)	Power (W)	Power (dBm)
806.0000	1.970	32.94	0	1.968	32.94
813.5000	1.960	32.92	1	1.969	32.94
821.0000	1.920	32.83	2	1.970	32.94
			3	1.969	32.94
			4	1.966	32.94
			5	1.958	32.92
			6	1.947	32.89
			7	1.939	32.88
			8	1.930	32.86
			9	1.922	32.84
			10	1.917	32.83
			11	1.911	32.81
			12	1.908	32.81
			13	1.902	32.79
			14	1.900	32.79
			15	1.895	32.78
			16	1.892	32.77
			17	1.887	32.76
			18	1.884	32.75
			19	1.883	32.75
			20	1.870	32.72
			21	1.871	32.72
			22	1.867	32.71
			23	1.867	32.71
			24	1.865	32.71
			25	1.862	32.70
			26	1.863	32.70
			27	1.861	32.70
			28	1.858	32.69
			29	1.858	32.69
			30	1.855	32.68
			31	1.854	32.68
			32	1.853	32.68
			33	1.853	32.68
			34	1.852	32.68
			35	1.852	32.68
			36	1.849	32.67
			37	1.847	32.66
			38	1.846	32.66
			39	1.845	32.66
			40	1.844	32.66

Power output measured with:
HP438A Power Meter, with:
HP8482H Power Sensor.
Calibration date: 13.10.02
Data recorded with:
HP34970 Data Acquisition
Calibration date: 24.12.01

Test Mode: CW

HDT600 with WaveNet and Bluetooth
Power Measurements for EME
Model F4415A

Initial Power Measurements RDLAP9600 S/N 296SCQ0268 DataTAC LLI 800700C1			RDLAP9600 Power Slump @ 815.5 MHz (Ch. 760)		
Frequency (MHz)	Power (W)	Power (dBm)	Time (min)	Power (W)	Power (dBm)
806.0000	1.960	32.92	0	1.929	32.85
815.5000	1.930	32.86	1	1.932	32.86
824.9875	1.920	32.83	2	1.934	32.86
			3	1.936	32.87
			4	1.935	32.87
			5	1.938	32.87
			6	1.937	32.87
			7	1.928	32.85
			8	1.929	32.85
			9	1.929	32.85
			10	1.931	32.86
			11	1.930	32.85
			12	1.930	32.86
			13	1.930	32.86
			14	1.929	32.85
			15	1.926	32.85
			16	1.923	32.84
			17	1.921	32.83
			18	1.917	32.83
			19	1.914	32.82
			20	1.911	32.81
			21	1.909	32.81
			22	1.909	32.81
			23	1.906	32.80
			24	1.904	32.80
			25	1.902	32.79
			26	1.899	32.79
			27	1.898	32.78
			28	1.896	32.78
			29	1.895	32.78
			30	1.892	32.77
			31	1.892	32.77
			32	1.889	32.76
			33	1.890	32.76
			34	1.886	32.76
			35	1.886	32.76
			36	1.885	32.75
			37	1.884	32.75
			38	1.881	32.74
			39	1.883	32.75
			40	1.882	32.75

Power output measured with:
HP438A Power Meter, with:
HP8482H Power Sensor.
Calibration date: 13.10.02
Data recorded with:
HP34970 Data Acquisition
Calibration date: 24.12.01

Test Mode: CW

Shortened Scan Results

FCC ID: AZ489FT7004; Test Date: 12/05/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021205-04
Model #: F4415A SN:296SCQ0268
TX Freq: 815.5 MHz

- Accessories -
Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

Shortened scan reflect highest S.A.R. producing configuration; Run time 6 minutes.
Representative "normal" scan run time was 28 minutes
"Shortened" scan measured S.A.R. w/ 10% duty cycle = 1.22 mW/g
"Normal" scan max. calc. S.A.R. w/ 10% duty cycle = 1.22 mW/g (see section 7.1 run # Ab-R1-021127-03)

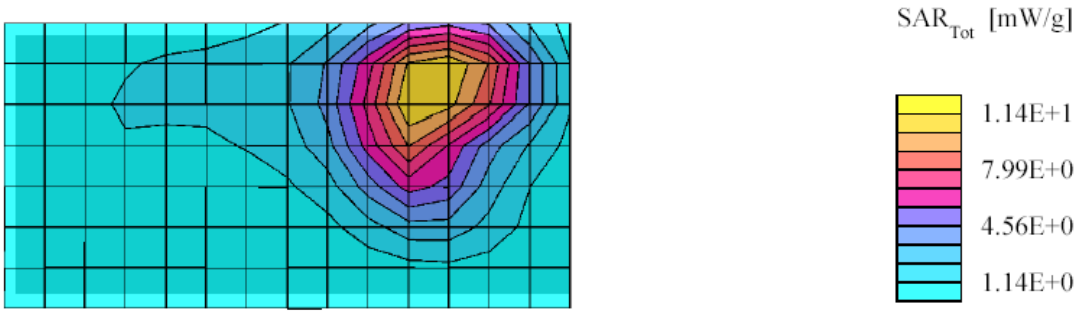
Display facing phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R (cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: σ = 0.99 mho/m ε = 53.4 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 5x5x7: SAR (1g): 12.2 mW/g, SAR (10g): 8.26 mW/g, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 12.2 mW/g, SAR (10g): 8.26 mW/g

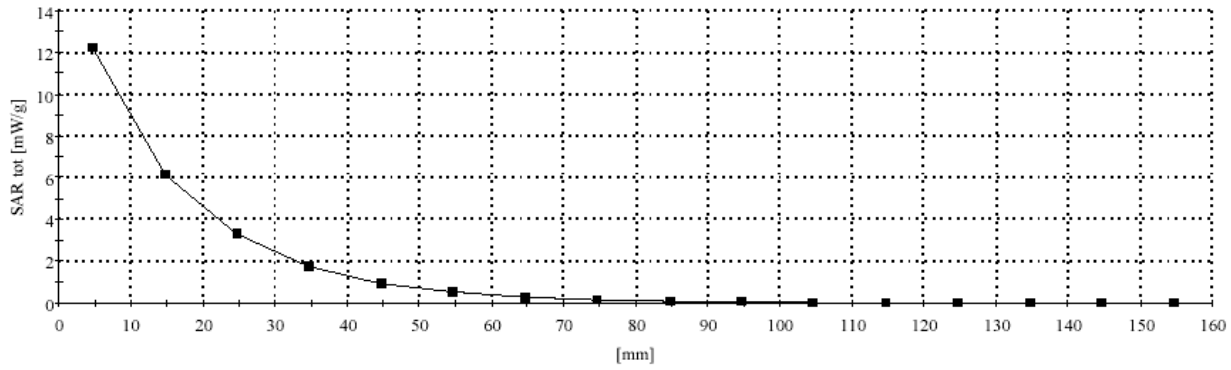
APPENDIX B
Data Results

FCC ID: AZ489FT7004; Test Date: 11/27/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021127-03
Model #: F4415A SN:296SCQ0268
TX Freq: 815.5 MHz

Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

Display facing phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: σ = 1.00 mho/m ε = 53.8 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 12.2 mW/g, SAR (10g): 8.25 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 22.5, 157.5, 4.7

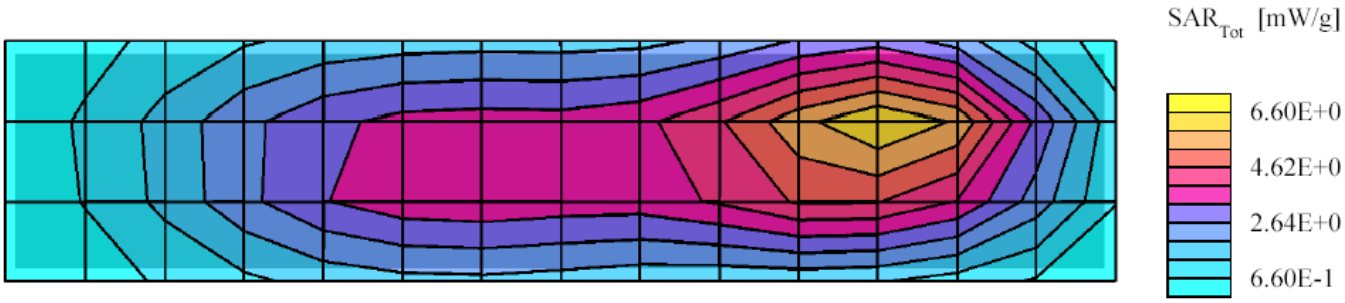


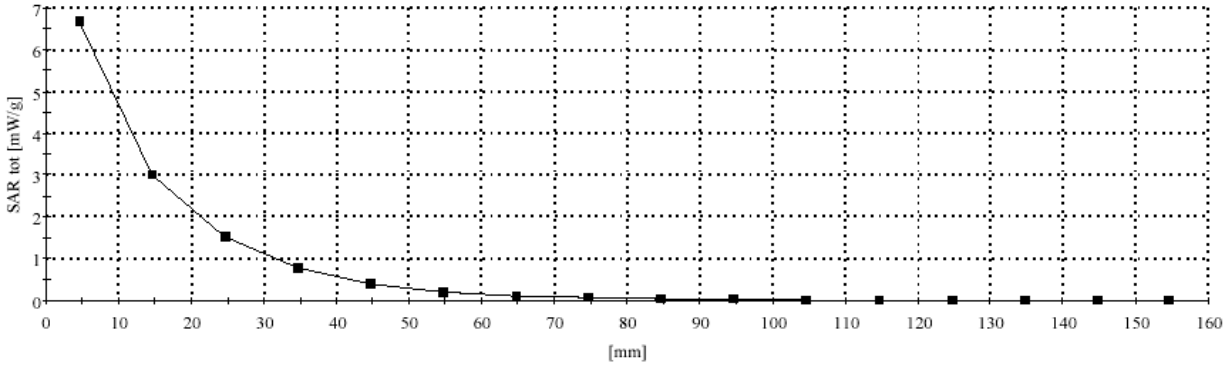


FCC ID: AZ489FT7004; Test Date: 12/02/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021202-08
Model #: F4415A SN:296SCQ0268
TX Freq: 815.5 MHz

Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT Right side against phantom
Flat Phantom; Device Section; Position: (90°,180°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: σ = 0.98 mho/m ε = 53.6 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 6.65 mW/g, SAR (10g): 4.24 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 15.0, 166.5, 4.7

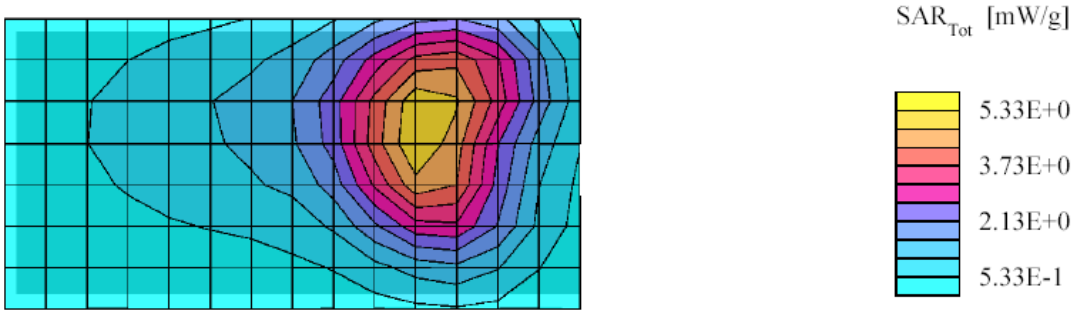


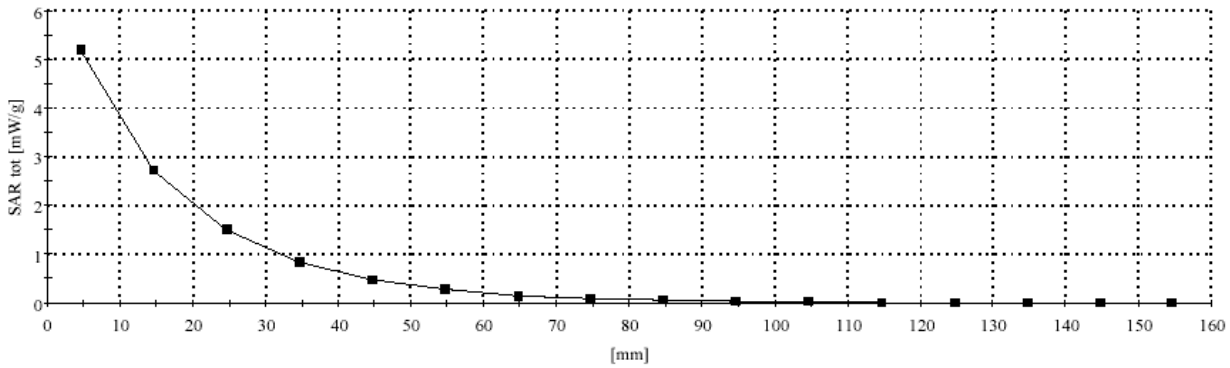


FCC ID: AZ489FT7004; Test Date: 12/03/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021203-05
Model #: F4415A SN:296SCQ0268
TX Freq: 815.5 MHz

Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: carry case FHN6396A
Audio Acc. None

Display facing phantom
Flat Phantom Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: σ = 0.98 mho/m ε = 53.3 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 5.29 mW/g, SAR (10g): 3.74 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 39.0, 151.5, 4.7

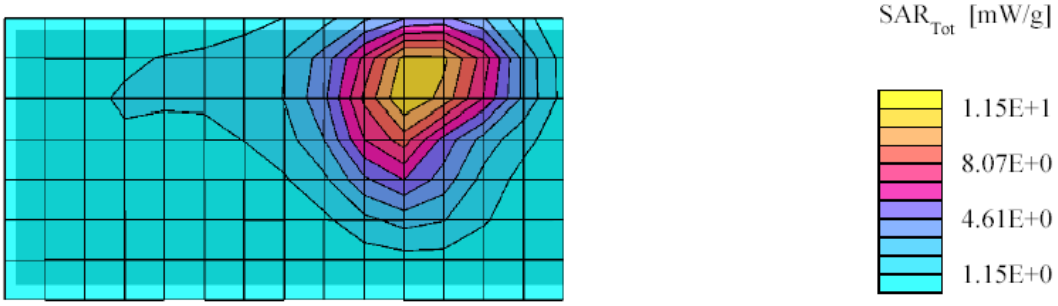


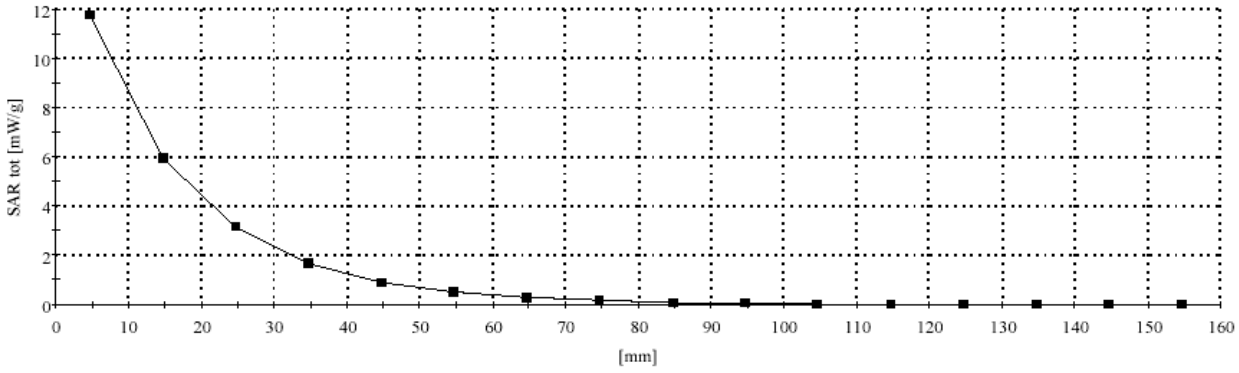


FCC ID: AZ489FT7004; Test Date: 12/04/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021204-02
Model #: F4415A SN:296SCQ0268
TX Freq: 806 MHz

Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT display against phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: ó = 0.98 mho/m år = 53.1 ñ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 11.7 mW/g, SAR (10g): 7.92 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 24.0, 154.5, 4.7

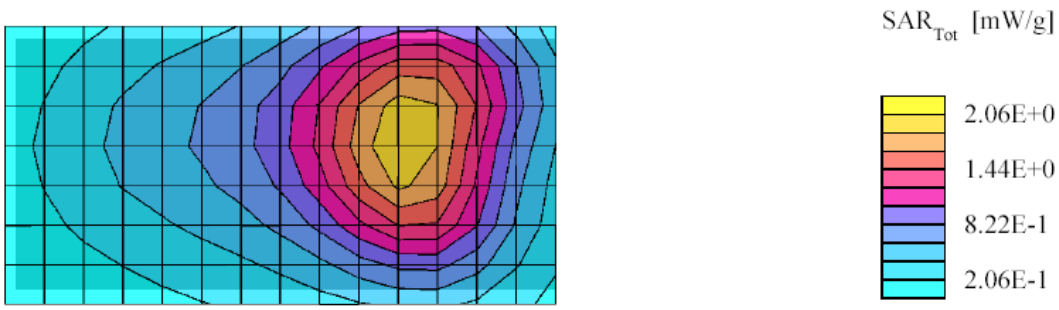


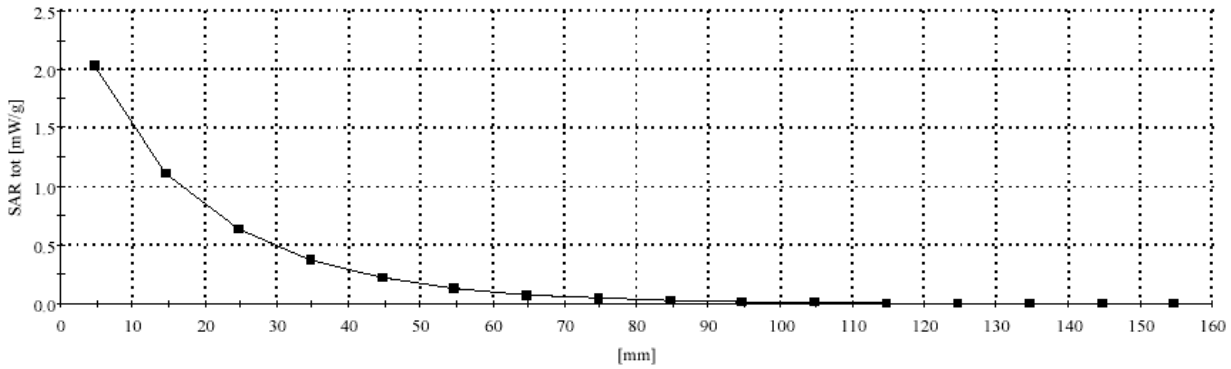


FCC ID: AZ489FT7004; Test Date: 12/04/02
Motorola CGISS EME Laboratory
Run #: Ab-R1-021204-06
Model #: F4415A SN:296SCQ0268
TX Freq: 815.5 MHz

Antenna: FAF5213A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT display facing phantom, positioned at 2.5 cm from phantom
Flat Phantom; Device Section; Position: (90°,90°);
Probe: ET3DV6R(cal date 5-21-02) - SN1545; ConvF(6.00,6.00,6.00); Probe cal date: 21/05/02; Crest factor: 1.0; FCC Body_814MHz: σ = 0.98 mho/m ε = 53.1 ρ = 1.00 g/cm3; DAE3: 363-V1 DAE Cal Date: 5/23/02
Cube 7x7x7: SAR (1g): 2.03 mW/g, SAR (10g): 1.48 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 42.0, 151.5, 4.7





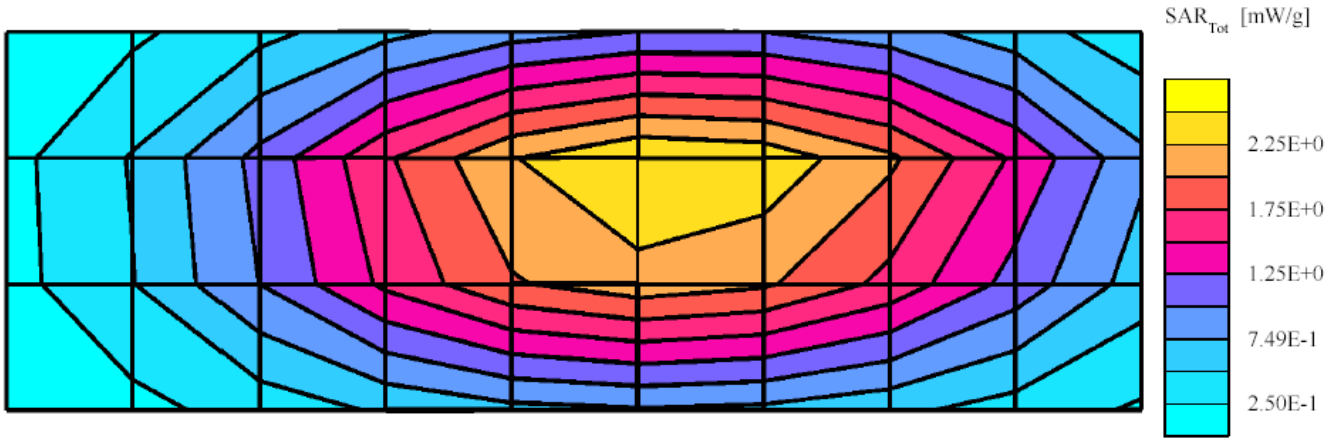
APPENDIX C

Dipole System Performance Check Results

Dipole validations at the head from SPEAG are provided in APPENDIX D herein. The CGISS EME lab used the SPEAG provided dipole to validate its performance to the IEEE specified system performance targets. Within the same day a system performance check was done using FCC body tissue parameters at the applicable frequency to generate the new system performance target values used for the body compliance assessment presented herein. The results of the CGISS EME daily system performance checks as well as the new target assessment at the body are provided in this appendix.

SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date:11/27/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021127-01
TX Freq: 835 MHz
Start Power; 250mW
- Comments-
Target at 1W is 11.09 mW/g (including drift) (1g)
SAR calculated is 10.84 mW/g, Percent from target (including drift) for 1g is 2.3%

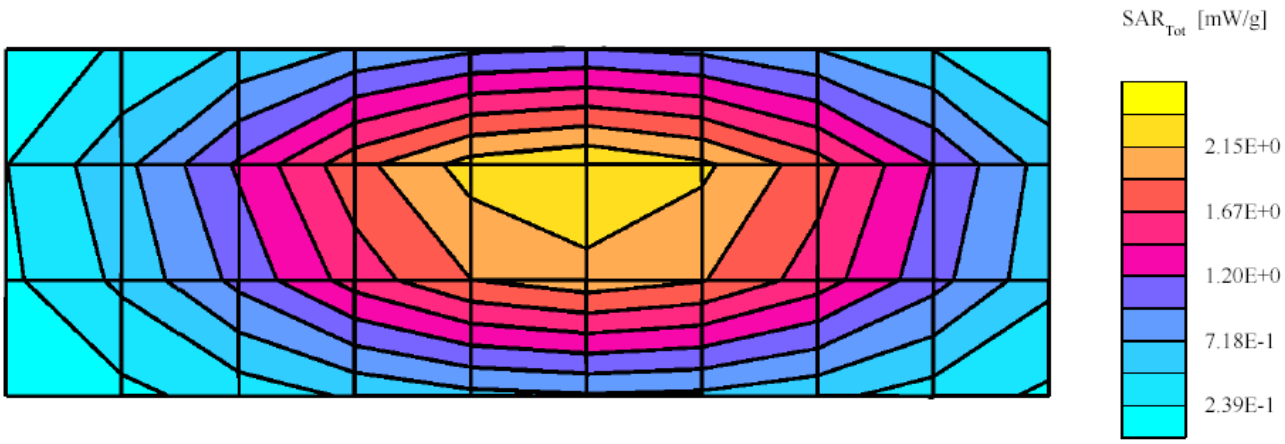
Flat Phantom; Device Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.01 mho/m ε = 53.6 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02 Cubes (2): Peak: 4.27 mW/g ± 0.08 dB, SAR (1g): 2.76 mW/g ± 0.07 dB, SAR (10g): 1.77 mW/g ± 0.08 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.5, 13.8) [mm]
Power drift: 0.08 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date: 12/02/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021202-01
Model #: D835V2 SN: 427
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 11.09 mW/g (including drift) (1g)
SAR calculated is 10.46 mW/g, Percent from target (including drift) for 1g is 5.7%

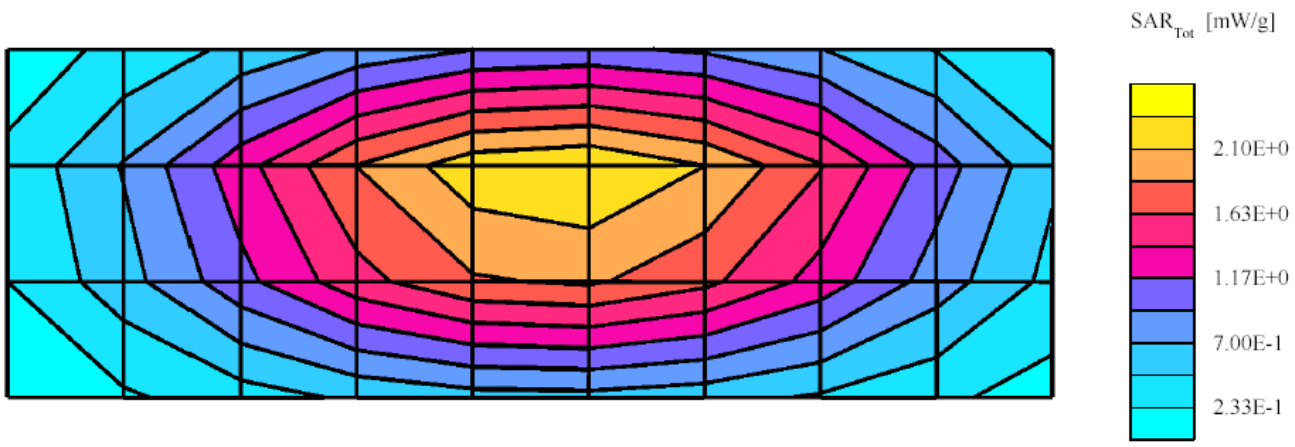
Flat Phantom; Device Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.01mho/m ε= 53.4 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 4.06 mW/g ± 0.07 dB, SAR (1g): 2.62 mW/g ± 0.07 dB, SAR (10g): 1.68 mW/g ± 0.07 dB, (Worst-case extrapolation) Penetration depth: 12.4 (11.4, 13.8) [mm]
Power drift: 0.01 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date:12/03/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021203-01
Model #: D835V2 SN: 427
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 11.09 mW/g (including drift) (1g)
SAR calculated is 10.52 mW/g, Percent from target (including drift) for 1g is 5.1%

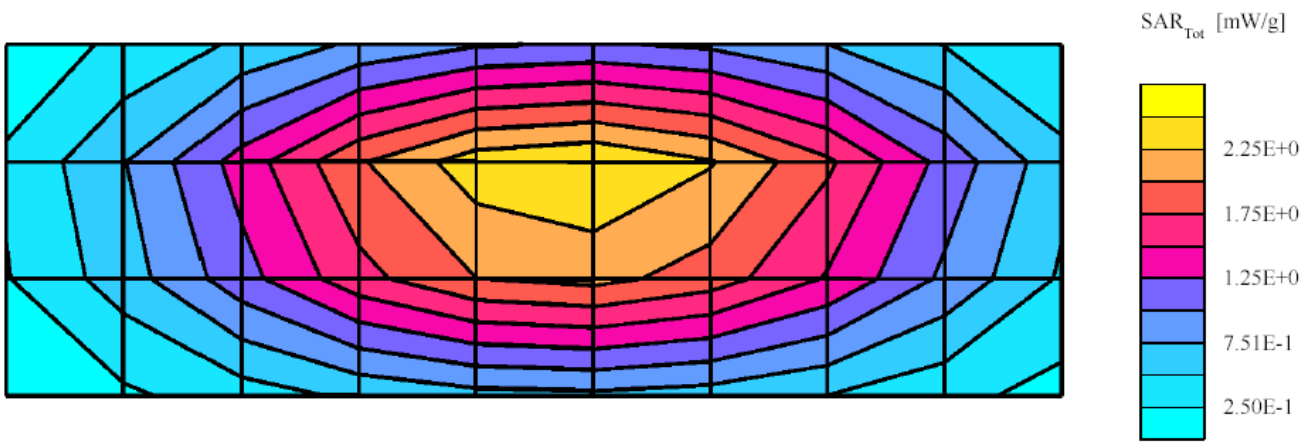
Flat Phantom; Device Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.00 mho/m ε = 53.2 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02 Cubes (2): Peak: 4.09 mW/g ± 0.07 dB, SAR (1g): 2.63 mW/g ± 0.07 dB, SAR (10g): 1.69 mW/g ± 0.07 dB, (Worst-case extrapolation) Penetration depth: 12.4 (11.4, 13.8) [mm]
Power drift: 0.00 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date:12/04/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021204-01
Model #: D835V2 SN: 427
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 11.09 mW/g (including drift) (1g)
SAR calculated is 10.79 mW/g, Percent from target (including drift) for 1g is 2.7%

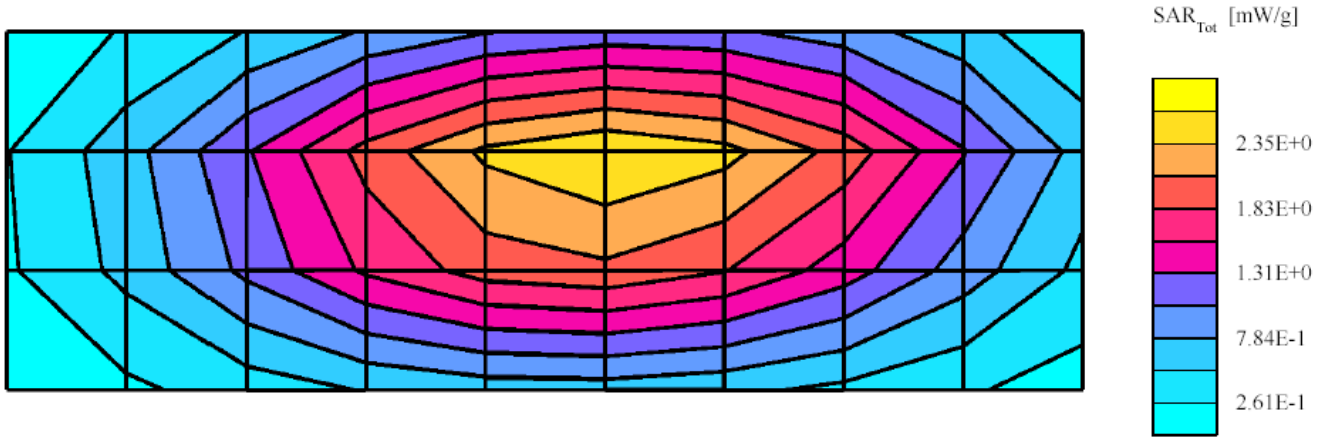
Flat Phantom; Device Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.00 mho/m ε= 53.1 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 4.20 mW/g ± 0.10 dB, SAR (1g): 2.71 mW/g ± 0.08 dB, SAR (10g): 1.74 mW/g ± 0.07 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.5, 13.9) [mm]
Power drift: 0.02 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date:12/05/02
Motorola CGISS EME Lab
Run #: Sys Perf-R1-021205-01
Model #: D835V2 SN: 427
TX Freq: 835 MHz
Start Power; 250mW

Target at 1W is 11.09 mW/g (including drift) (1g)
SAR calculated is 11.00 mW/g, Percent from target (including drift) for 1g is 0.8%

Flat Phantom; Device Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.01 mho/m ε= 53.0 ρ = 1.00 g/cm3; DAE3: SN363-V1 DAE Cal Date: 05/23/02
Cubes (2): Peak: 4.26 mW/g ± 0.08 dB, SAR (1g): 2.75 mW/g ± 0.07 dB, SAR (10g): 1.77 mW/g ± 0.07 dB, (Worst-case extrapolation) Penetration depth: 12.6 (11.5, 13.9) [mm]
Power drift: 0.00 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	11/20/2002	Frequency (MHz):	835MHz
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS R1	Ambient Temp.(°C):	22.1
Probe Serial #:	ET3DV6-1545	Tissue Temp.(°C):	20.6
DAE Serial #:	363		

Tissue Characteristics

Permitivity:	53.3	Phantom Type/SN:	80302002A
Conductivity:	1.01	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	D835V2 (Dipole)
Reference SN:	427

Power to Dipole: 250 mW

Measured SAR Value:	2.78 mW/g,	1.79 mW/g (10g avg.)
Power Drift:	0.01 dB	
New Target/Measured SAR Value: (normalized to 1.0 W, including drift)	11.09 mW/g,	7.14 mW/g (10g avg.)

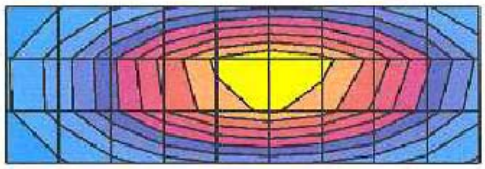
Test performed by: S.Whalen Initial: SW

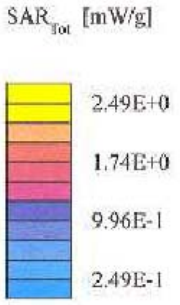
Sys. Per. Chk. Form: 021024

SPEAG Dipole 835MHz. Test Date:11/20/02

Run #: Sys Perf-R1-021120-02 Phantom #: 80302002A / S8
Model #: D835V2 SN: 427
Robot: CGISS-1 Tester: S. Whalen
TX Freq: 835 MHz Sim Tissue Temp: 20.6 (Celsius)
Start Power; 250mW
DAE3: SN363-V1 DAE Cal Date: 05/23/02
- Comments-
New Target at 1W is mW/g (including drift) (1g)

Flat Phantom; Device
Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.00,6.00,6.00); Crest factor: 1.0; FCC Body_835 MHz: σ = 1.01 mho/m ε_r = 53.3 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.31 mW/g ± 0.06 dB, SAR (1g): 2.78 mW/g ± 0.07 dB, SAR (10g): 1.79 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 12.5 (11.4, 13.9) [mm]
Powerdrift: 0.01 dB





Motorola CGISS EME Lab

SYSTEM VALIDATION

Date:	11/20/2002	Frequency (MHz):	835
Lab Location:	CGISS	Mixture Type:	IEEE Head
Robot System:	R1	Ambient Temp.(°C):	22.4
Probe Serial #:	ET3DV6-1545	Tissue Temp.(°C):	20.9
DAE Serial #:	363		

Tissue Characteristics

Permitivity:	41.6	Phantom Type/SN:	SAMTP1209
Conductivity:	0.97	Distance (mm):	15 (tissue/dipole cnt)

Reference Source: D835V2 (Dipole)
Reference SN: 427

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

Target SAR Value: 9.5 mW/g, 6.2 mW/g (10g avg.)
(normalized to 1.0 W)

Measured SAR Value: 2.62 mW/g, 1.68 mW/g (10g avg.)
Power Drift: 0.04 dB

Measured SAR Value: 10.38 mW/g, 6.66 mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty): 9.30 % (1g ave)
7.39 % (10g ave)

Test performed by: S.Whalen Initial: SCW

SPEAG Dipole 835MHz. Test Date:11/20/02

Run #: Sys Perf-R1-021120-06 Phantom #: SAMTP1209
Model #: D835V2 SN: 427
Robot: CGISS-1 Tester: S. Whalen
TX Freq: 835 MHz Sim Tissue Temp: 20.9 (Celsius)
Start Power: 250mW
DAE3: SN363-V1 DAE Cal Date: 05/23/02
- Comments-
Target at 1W is 9.5 mW/g (including drift) (1g)

SAR calculated is 10.38 mW/g, Percent from target (including drift) for 1g is 9.30%
SAM; Flat
Probe: ET3DV6R(cal date 5-21-02) - SN1545;Probe Cal Date: 21/05/02ConvF(6.20,6.20,6.20); Crest factor: 1.0; IEEE Head_835 MHz: σ = 0.94 mho/m ε_r = 41.9 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.11 mW/g ± 0.06 dB, SAR (1g): 2.62 mW/g ± 0.07 dB, SAR (10g): 1.68 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 12.0 (11.1, 13.2) [mm]
Powerdrift: 0.04 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:	
Approved by:	

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

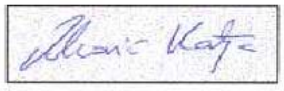
Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

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)

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:	427
Place of Calibration:	Zurich
Date of Calibration:	October 15, 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:	D. Veller
Approved by:	

1. Measurement Conditions

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

Relative Dielectricity	**41.3**	± 5%
Conductivity	**0.88 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.6 at 835 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 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250mW ± 3 %. The results are normalized to 1W input power.

2 SAR Measurement with DASY4 System

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

averaged over 1 cm^3 (1 g) of tissue:	**9.64 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.20 mW/g**

3. Dipole Impedance and Return Loss

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

Electrical delay:	**1.420 ns**	(one direction)
Transmission factor:	**0.992**	(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} = **52.1 Ω**
	Im {Z} = **0.4 Ω**
Return Loss at 835 MHz	**-33.3 dB**

4. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

5. Design

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

6. Power Test

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

Date/Time: 10/15/02 19:51:20

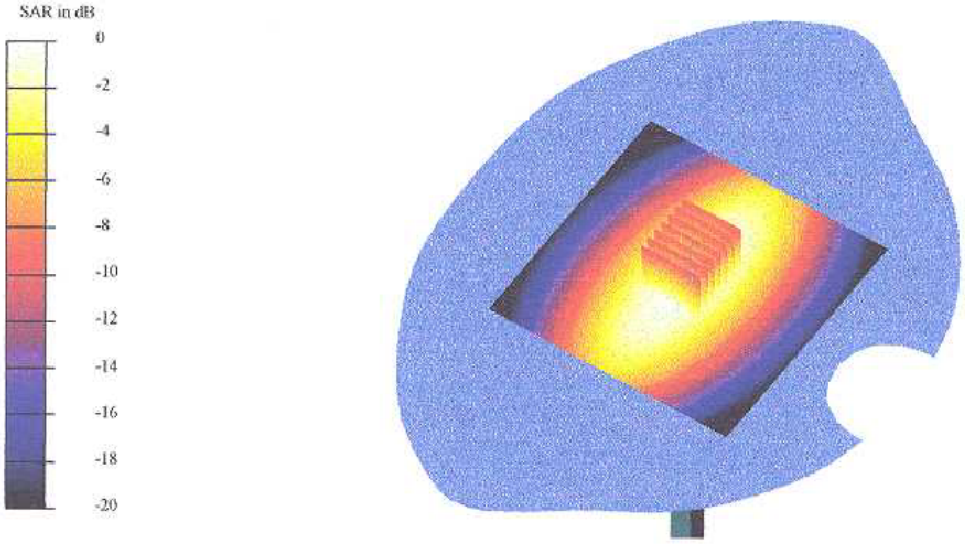
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN427_SN1507_HSL835_151002.da4

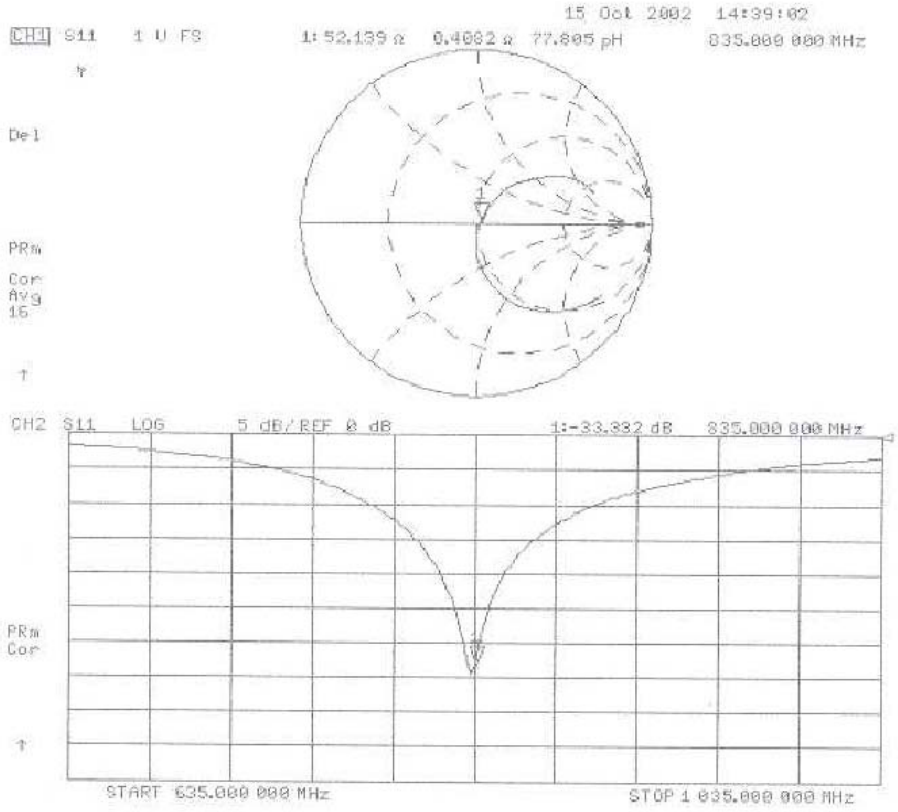
DUT: Dipole 835 MHz Type & Serial Number: D835V2 - SN427
Program: Dipole Calibration; Pin = 250 mW; d = 10 mm

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 835 MHz (σ = 0.88 mho/m, ε = 41.3, ρ = 1000 kg/m3)
Phantom section: FlatSection

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(6.6, 6.6, 6.6); Calibrated: 1/24/2002
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN410; Calibrated: 7/18/2002
- Phantom: SAM 4.0 - TP:1006
- Software: DASY4, V4.0 Build 35

Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm
Reference Value = 56.3 V/m
Peak SAR = 3.61 mW/g
SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.55 mW/g
Power Drift = 0.01 dB




15 Oct 2002 14:39:02
CH1 S11 1 U FS
1: 52.139 Ω 0.4082 Ω 77.805 pH
835.000 000 MHz
Del
PRm
Cor
Avg
16
CH2 S11 LOG 5 dB/ REF 0 dB
1:-33.382 dB 835.000 000 MHz
PRm
Cor
START 635.000 000 MHz
STOP 1 035.000 000 MHz

APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT7004. 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 FHN6394A
Back View

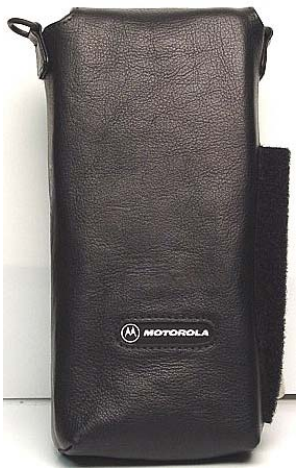


Photo 2.
Model FHN6394A
Front View

Photo 3.
Model FHN6394A
Side View

Photo 4.
Model FHN6395A
Back View

Photo 5.
Model FHN6395A
Front View

Photo 6.
Model FHN6395A
Side View

Photo 7.
Model FHN6396A
Back View

Photo 8.
Model FHN6396A
Front View

Photo 9.
Model FHN6396A
Side View

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 distances between device and phantom surface. Range (mm)	Comments
FHN6394A	No	11- 40	Similar to FHN6395A; No opening for the display and keypad
FHN6395A	Yes	11 - 40	NA
FHN6396A	Yes	12 - 16	NA