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:	March 17, 2003
Report Revision:	Rev. O
Manufacturer:	Motorola South - ARAD
Product Description:	Data Terminal w/ 0.6W iDEN TDMA, 16 QAM; 1mW Bluetooth: Frequency Hopping Spread Spectrum (FHSS)
FCC ID:	**AZ489FT7007**
Device Model:	F4415A (VA00010AB)

Test Period:	2/21/03 – 3/12/03
EME Tech:	Ed Church
EME Eng.:	Deanna Zakharia (Sr. Principle Staff Eng.)
Author:	Michael Sailsman Global EME Regulatory Affairs Liaison

Note: Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 2.0 of this report.

Signature on File — 3/17/03

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

Date Approved

APPENDIX A

Power Slump Data/Shortened Scan

DUT Power versus time data (FNN5105A battery)

HDT600 with iDEN iO1000
Power Measurements for EME
Model F4415A

Initial Power Measurements iDEN HDT600 iO1000 IMEI 000200047164130			iDEN Power Slump @ 813.5 MHz (Ch. 600)		
Frequency (MHz)	Power (W)	Power (dBm)	Time (min)	Power (W)	Power (dBm)
806.0000	0.707	28.49	0	0.702	28.46
813.5000	0.703	28.47	1	0.713	28.53
820.9875	0.690	28.39	2	0.719	28.57
			3	0.721	28.58
			4	0.726	28.61
			5	0.728	28.62
			6	0.708	28.50
			7	0.722	28.58
			8	0.720	28.57
			9	0.698	28.44
			10	0.701	28.46
			11	0.702	28.46
			12	0.701	28.46
			13	0.704	28.47
			14	0.705	28.48
			15	0.703	28.47
			16	0.706	28.49
			17	0.707	28.49
			18	0.706	28.49
			19	0.709	28.50
			20	0.709	28.51
			21	0.707	28.50
			22	0.710	28.51
			23	0.710	28.51
			24	0.708	28.50
			25	0.711	28.52
			26	0.712	28.52
			27	0.711	28.52
			28	0.695	28.42
			29	0.599	27.77
			30	0.711	28.52
			31	0.607	27.83
			32	0.658	28.18
			33	0.710	28.51
			34	0.586	27.68
			35	0.637	28.04
			36	0.693	28.41
			37	0.619	27.92
			38	0.620	27.92
			39	0.703	28.47
			40	0.674	28.29

Power output measured with
HP438A Power Meter,
with HP8482H Power Sensor.
Calibration date: 12.01.03
Next calibration: 31.12.03
Data recorded with:
HP34970 Data Acquisition
Calibration date: 13.01.03
Next calibration: 31.12.03

Test Mode: TDMA 67.5%

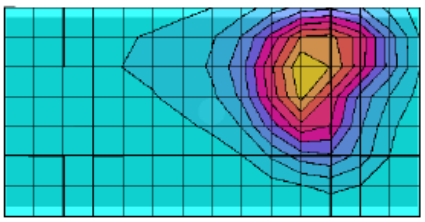
Shortened Scan Results

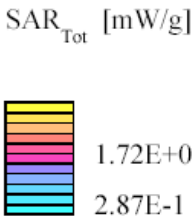
FCC ID: AZ489FT7007; Test Date: 3/12/03
Motorola CGISS EME Laboratory
Run #: EC-Ab-R1-030312-04
Model #: F4415A (VA00010AB); SN:296SDA0286
SIM TEMP: 21.3 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

Shortened scan reflect highest S.A.R. producing configuration; Run time 15 minutes.
Representative "normal" scan run time was 30 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift = 2.60 mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift = 2.52 mW/g (see section 7.1 run # EC-Ab-R3-030312-02)

DUT display towards phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(6.50,6.50,6.50); Probe cal date: 26/02/03; Crest factor: 1.5; FCC Body 813: $\sigma = 0.94$ mho/m $\varepsilon = 52.5$ $\rho = 1.00$ g/cm3; DAE CAL DATE: 02-19-03
Cube 5x5x7: SAR (1g): 2.60 mW/g, SAR (10g): 1.75 mW/g * Max outside, (Worst-case extrapolation)
Cube 5x5x7: Dx = 8.0, Dy = 8.0, Dz = 5.0; SAR (1g): 2.60 mW/g, SAR (10g): 1.75 mW/g * Max outside
Power drift: 0.08 dB
Note: "Max outside" has been identified by SPEAG as an unresolved intermittent occurrence with the DASY 3 application even when the entire peak area is captured.



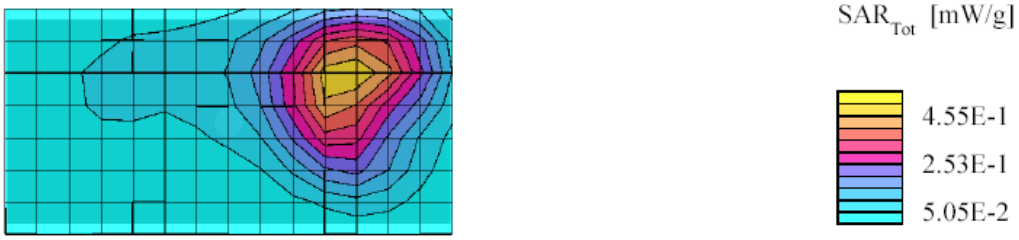


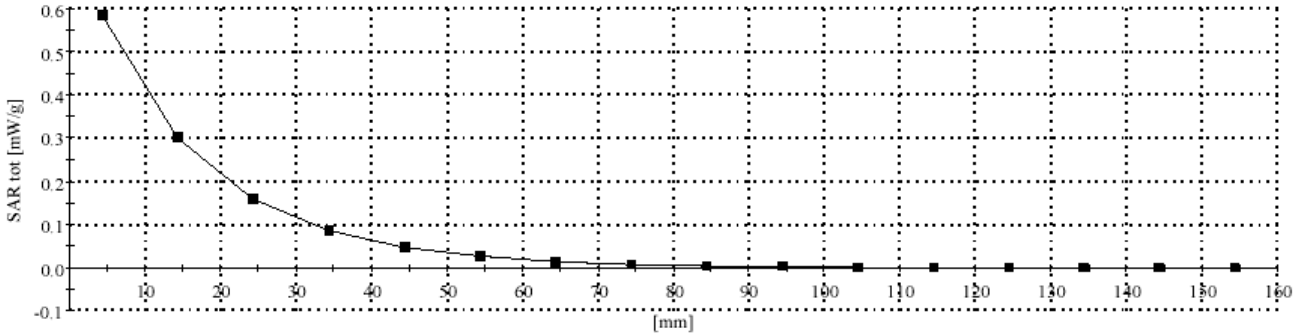
APPENDIX B
Data Results

FCC ID: AZ489FT7007; Test Date: 2/21/03
Motorola CGISS EME Laboratory
RUN #: EC-Ab-R3-030221-02
Model #: F4415A (VA00010AB); SN: 296SDA0292
SIM TEMP: 22.0 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT display towards phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002); ConvF(6.90,6.90,6.90); Probe cal date: 3/22/02; Crest factor: 6.0; FCC Body 813: σ = 0.99 mho/m ε = 53.0 ρ = 1.00 g/cm3; DAE CAL DATE: 02-19-03
Cube 7x7x7: SAR (1g): 0.562 mW/g, SAR (10g): 0.388 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 31.5, 157.5, 4.4
Power drift: 0.35 dB

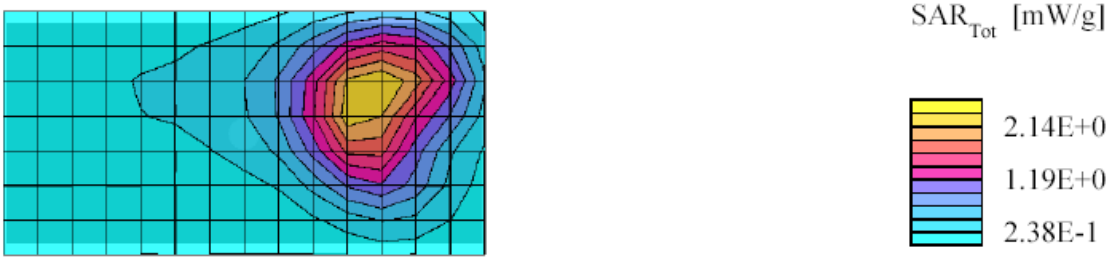


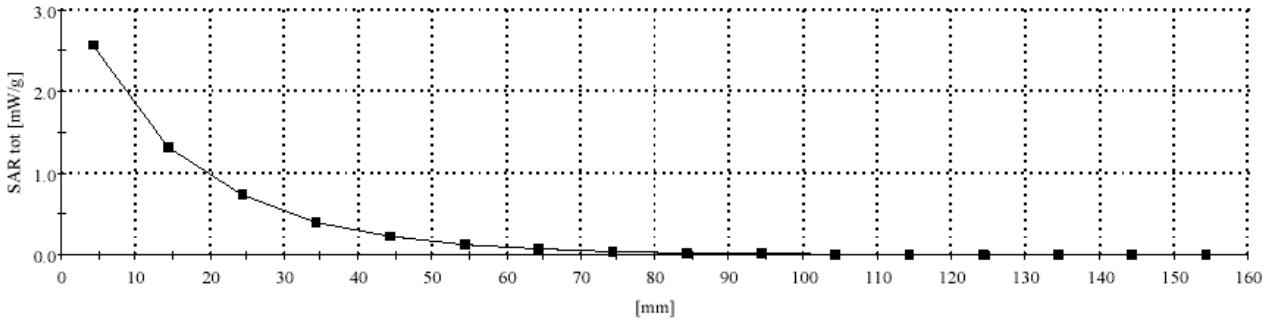


FCC ID: AZ489FT7007; Test Date: 3/09/03
Motorola CGISS EME Laboratory
Run #: EC-Ab-R3-030309-07
Model #: F4415A (VA00010AB); SN: 296SDA0286
SIM TEMP: 19.1 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT display against phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002); ConvF(6.90,6.90,6.90); Probe cal date: 3/22/02; Crest factor: 1.5; FCC Body 813: σ = 0.98 mho/m ε = 54.5 ρ = 1.00 g/cm3; DAE CAL DATE: 11-11-02
Cube 7x7x7: SAR (1g): 2.47 mW/g, SAR (10g): 1.71 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 36.0, 157.5, 4.4
Power drift: 0.23 dB

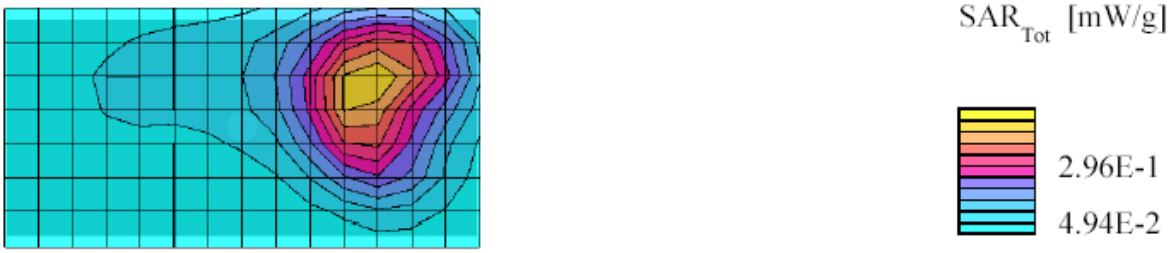


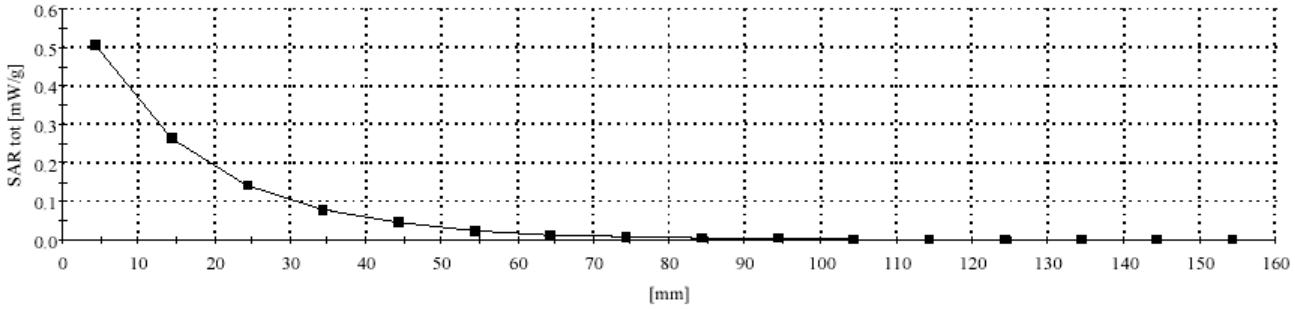


FCC ID: AZ489FT7007; Test Date: 3/09/03
Motorola CGISS EME Laboratory
Run #: EC-Ab-R3-030224-04
Model #: F4415A (VA00010AB); SN: 296SDA0292
Sim Temp: 21.2 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: carry case FHN6396A
Audio Acc. None

DUT display towards phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002); ConvF(6.90,6.90,6.90); Probe cal date: 3/22/02; Crest factor: 6.0; FCC Body 813: σ = 0.98 mho/m ε = 52.9 ρ = 1.00 g/cm3; DAE CAL DATE: 11-11-02
Cube 7x7x7: SAR (1g): 0.489 mW/g, SAR (10g): 0.340 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 33.0, 159.0, 4.4
Power drift 0.07

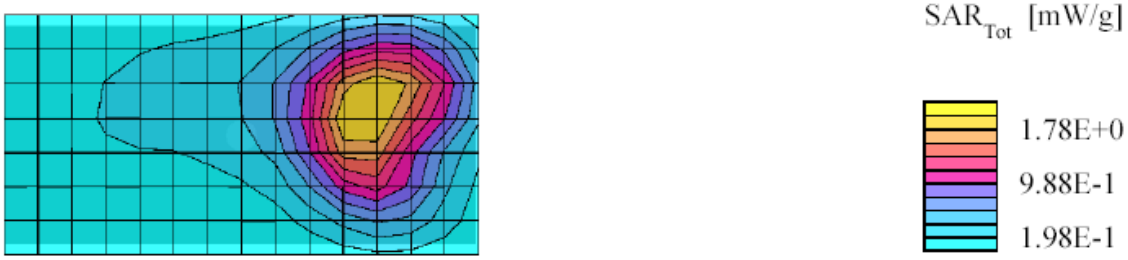


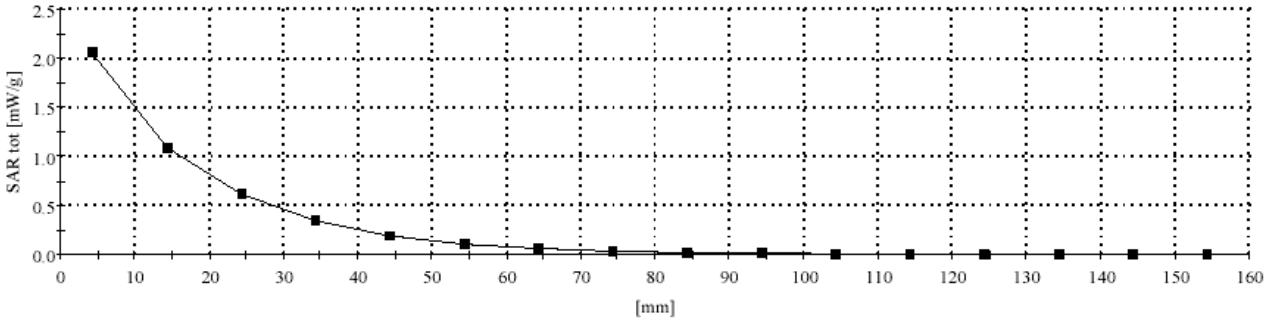


FCC ID: AZ489FT7007; Test Date: 3/09/03
Motorola CGISS EME Laboratory
Run #: EC-Ab-R3-030309-04
Model #: F4415A (VA00010AB); SN: 296SDA0292
SIM TEMP: 19.1 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: FMN6396A
Audio Acc. None

DUT display towards phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002); ConvF(6.90,6.90,6.90); Probe cal date: 3/22/02; Crest factor: 1.5; FCC Body 813: σ = 0.98 mho/m ε = 54.5 ρ = 1.00 g/cm3; DAE CAL DATE: 11-11-02
Cube 7x7x7: SAR (1g): 2.07 mW/g, SAR (10g): 1.44 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 40.5, 159.0, 4.4
Power Drift: -0.13 dB

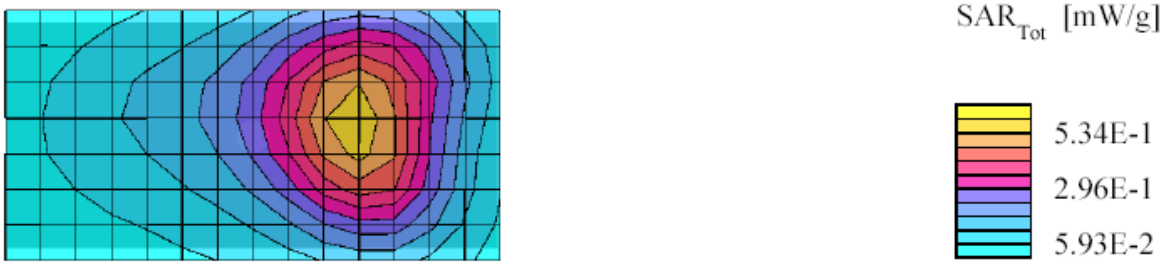


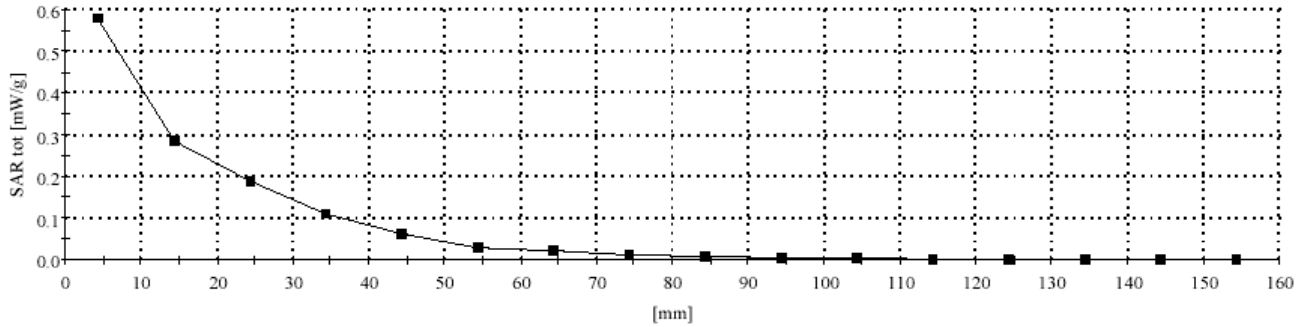


FCC ID: AZ489FT7007; Test Date: 3/4/03
Motorola CGISS EME Laboratory
Run #: EC-Ab-R3-030304-10
Model #: F4415A (VA00010AB); SN: 296SDA0292
SIM TEMP: 22.3 C
TX Freq: 813.5 MHz

Antenna: FAF5214A internal
Battery Kit: FNN5105A
Carry: None
Audio Acc. None

DUT display towards phantom w/ 2.5 cm separation
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002); ConvF(6.90,6.90,6.90); Probe cal date: 3/22/02; Crest factor: 1.5; FCC Body 814: σ = 0.99mho/m ε = 53.4 ρ = 1.00 g/cm3; DAE CAL DATE: 02-19-03
Cube 7x7x7: SAR (1g): 0.584 mW/g, SAR (10g): 0.411 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 46.5, 148.5, 4.4
Power drift: -0.15 dB





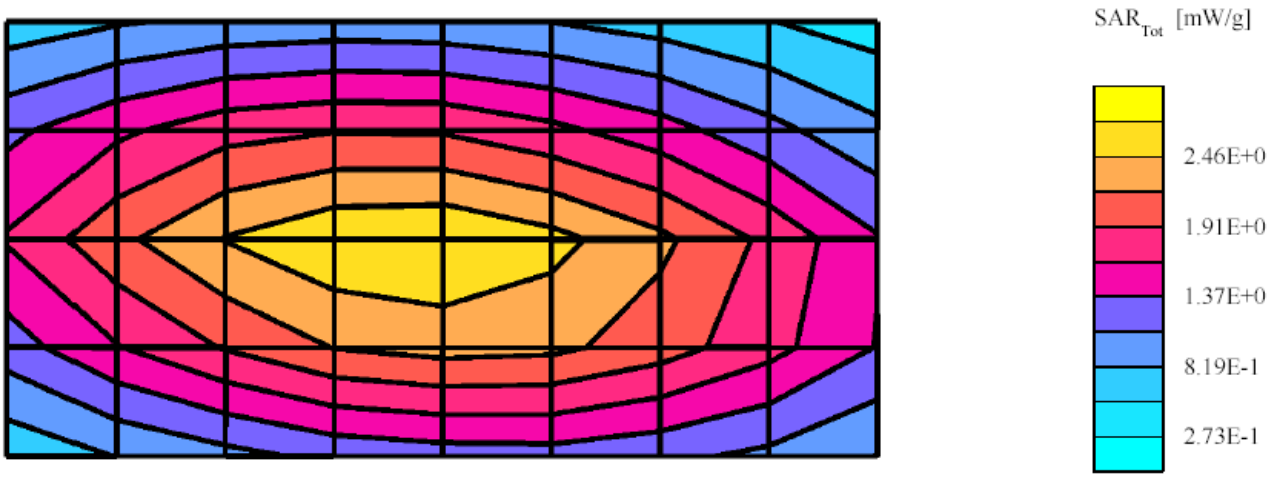
APPENDIX C

Dipole System Performance Check Results

SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 2/21/03
Motorola CGISS EME Lab
Run #: Sys Perf_R3_030221_01
TX Freq: 835 MHz
Sim Tissue Temp: 22.0 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.75 mW/g, Percent from target (including drift) for 1g is 0.98 %

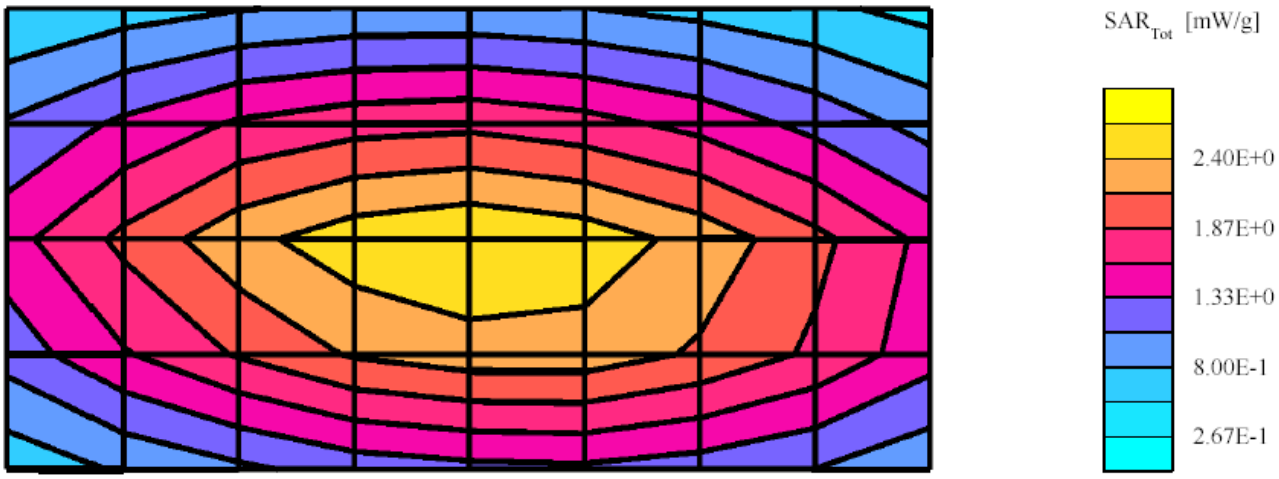
Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: σ = 1.01 mho/m ε= 52.9 ρ = 1.00 g/cm3; DAE Cal Date: 02/08/02
Cubes (2): Peak: 4.16 mW/g ± 0.04 dB, SAR (1g): 2.67 mW/g ± 0.04 dB, SAR (10g): 1.71 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.4 (11.3, 13.9) [mm]
Power drift: -0.03 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 2/24/03
Motorola CGISS EME Lab
Run #: Sys Perf-R3-03024-01
TX Freq: 835 MHz
Sim Tissue Temp: 21.0 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.50 mW/g, Percent from target (including drift) for 1g is 1.37 %

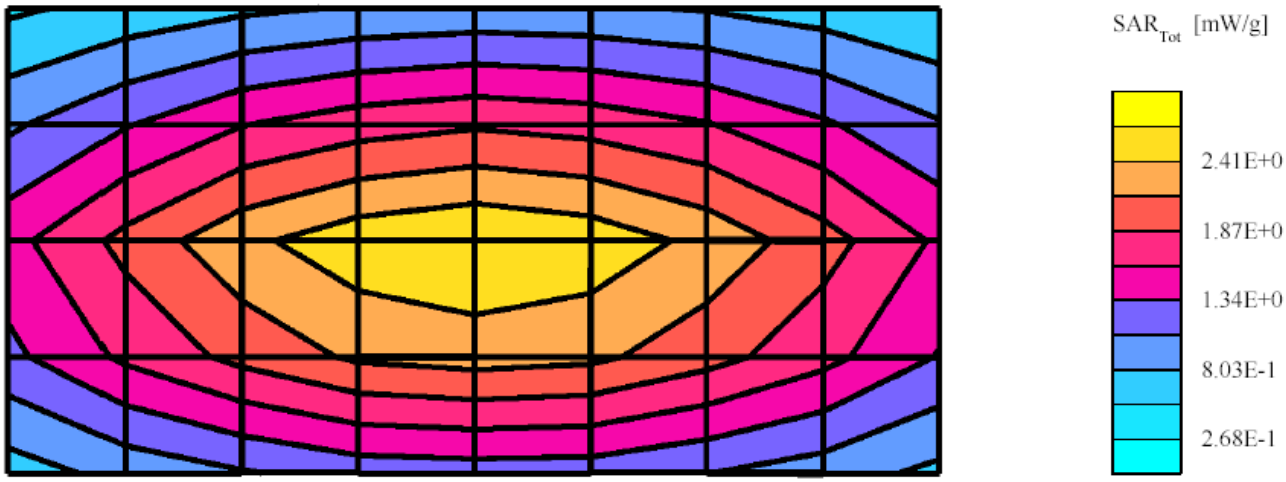
Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: σ = 1.00 mho/m ε= 52.7 ρ = 1.00 g/cm3; DAE Cal Date: 02/08/02
Cubes (2): Peak: 4.08 mW/g ± 0.05 dB, SAR (1g): 2.62 mW/g ± 0.05 dB, SAR (10g): 1.68 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.4 (11.3, 13.9) [mm]
Power drift: -0.01 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date:3/03/03
Motorola CGISS EME Lab
Run #: Sys Perf-R3-030303-10
TX Freq: 835 MHz
Sim Tissue Temp: 22.3 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.54 mW/g, Percent from target (including drift) for 1g is 0.99 %

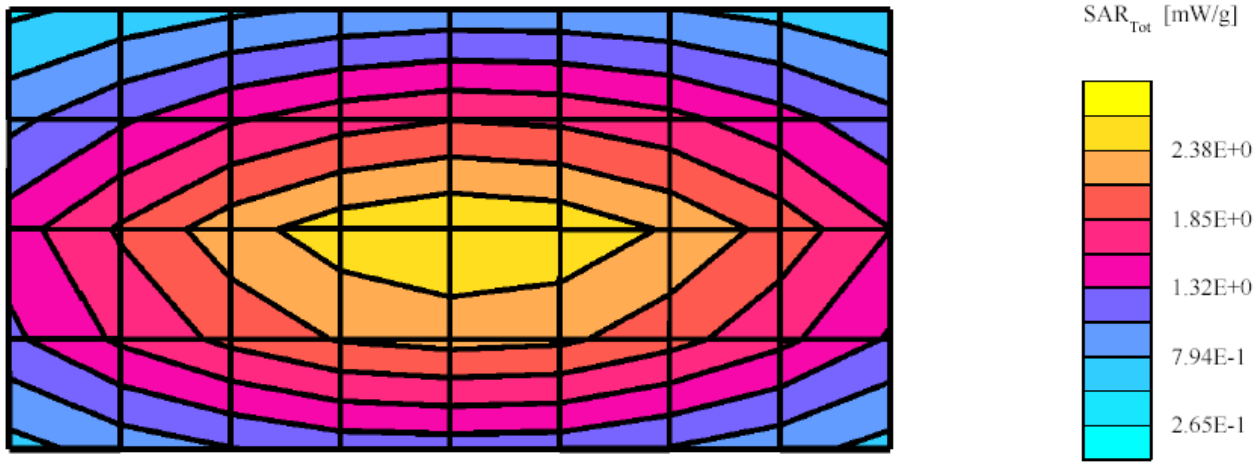
Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: $\sigma = 1.00$ mho/m $\varepsilon = 53.2$ $\rho = 1.00$ g/cm3; DAE Cal Date: 02/08/02
Cubes (2): Peak: 4.09 mW/g ± 0.05 dB, SAR (1g): 2.63 mW/g ± 0.05 dB, SAR (10g): 1.68 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.3, 14.0) [mm]
Power drift: -0.01 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/04/02
Motorola CGISS EME Lab
Run #: Sys Perf-R3-030304-01
TX Freq: 835 MHz
Sim Tissue Temp: 22.5 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.38 mW/g, Percent from target (including drift) for 1g is - 2.50 %

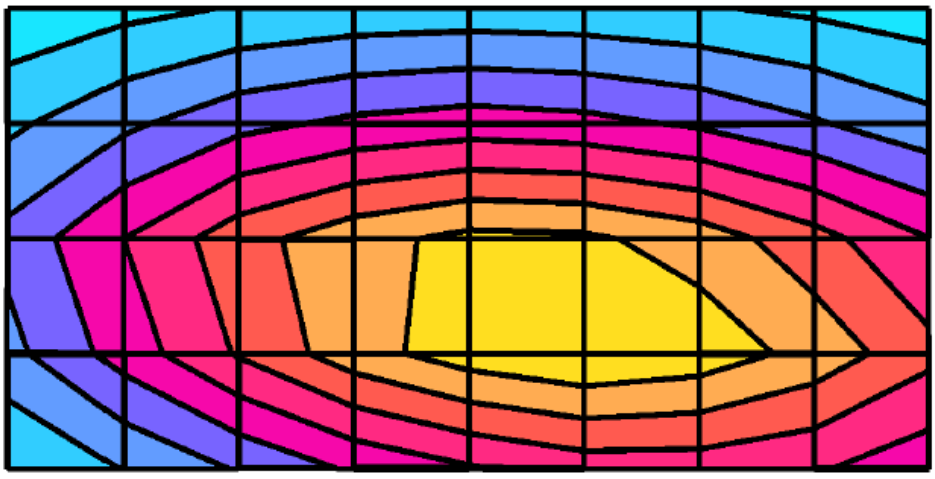
Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: σ = 1.01 mho/m ε = 53.1 ρ = 1.00 g/cm3; DAE Cal Date: 02/08/02
Cubes (2): Peak: 4.04 mW/g ± 0.05 dB, SAR (1g): 2.59 mW/g ± 0.06 dB, SAR (10g): 1.67 mW/g ± 0.06 dB, (Worst-case extrapolation) Penetration depth: 12.5 (11.3, 14.0) [mm]
Power drift: -0.01 dB

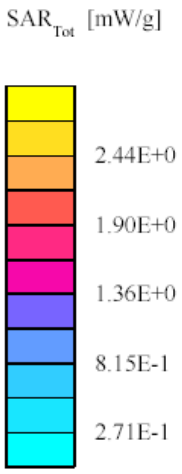


SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/09/03
Motorola CGISS EME Lab
Run #: Sys Perf-R3-030309-01
TX Freq: 835 MHz
Sim Tissue Temp: 19.1 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.98 mW/g, Percent from target (including drift) for 1g is3.06 %

Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: σ = 1.01 mho/m ε= 54.3 ρ = 1.00 g/cm3; DAE Cal Date: 02/08/02
Cubes (2): Peak: 4.16 mW/g ± 0.03 dB, SAR (1g): 2.70 mW/g ± 0.04 dB, SAR (10g): 1.75 mW/g ± 0.04 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.6, 14.1) [mm]
Power drift: -0.07 dB

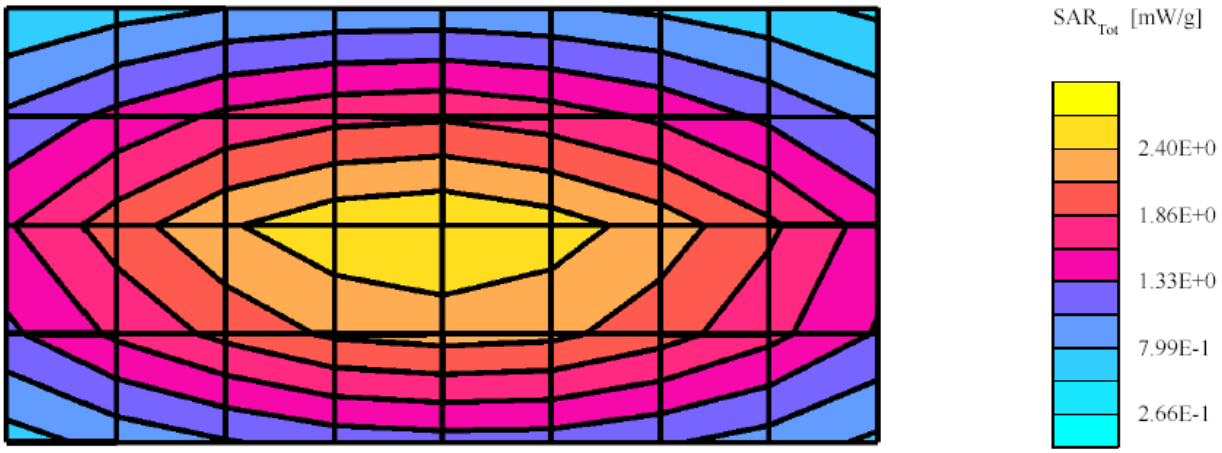




SPEAG 835 MHz Dipole; Model D835V2, SN 426; Test Date: 3/10/03
Motorola CGISS EME Lab
Run #: Sys Perf-R3-030310-01
TX Freq: 835 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power; 250mW

Target at 1W is 10.65 mW/g (1g)
SAR calculated is 10.51 mW/g, Percent from target (including drift) for 1g is - 1.29 %

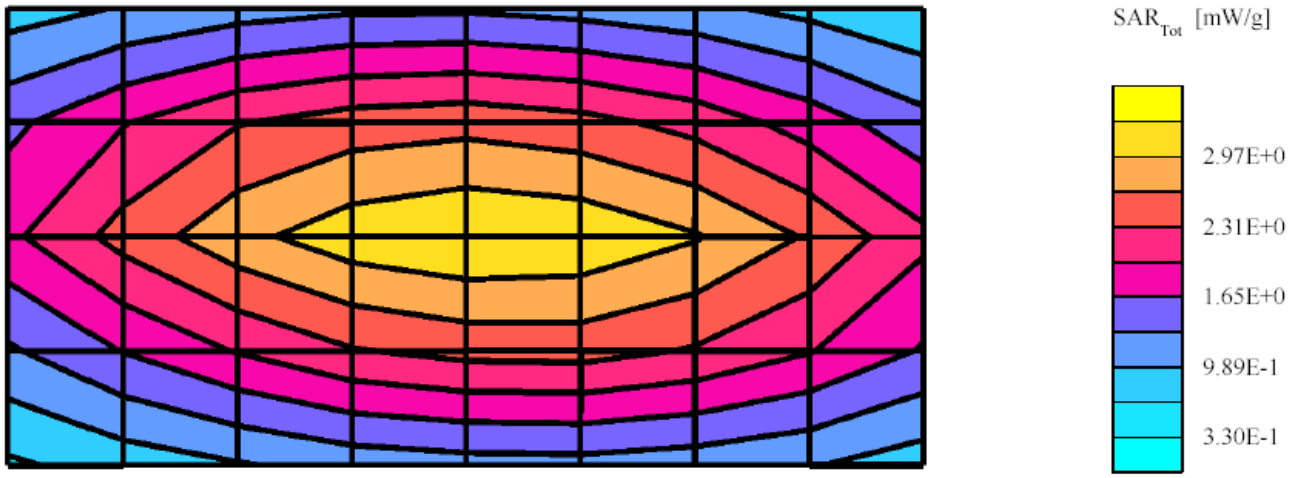
Flat; Probe: ET3DV6 - SN1393 (Cal Date 03-22-2002);Probe Cal Date: 3/22/02ConvF(6.90,6.90,6.90); Crest factor: 1.0; FCC Body 835: σ = 1.01 mho/m ε= 54.8 ρ = 1.00 g/cm3; DAE Cal Date: 11/11/02
Cubes (2): Peak: 4.04 mW/g ± 0.05 dB, SAR (1g): 2.61 mW/g ± 0.05 dB, SAR (10g): 1.68 mW/g ± 0.05 dB, (Worst-case extrapolation) Penetration depth: 12.7 (11.5, 14.2) [mm]
Power drift: -0.03 dB



SPEAG 835 MHz Dipole; Model D835V2, SN 427; Test Date: 3/12/03
Motorola CGISS EME Lab
Run #: Sys Perf-R3-030312-01
TX Freq: 835 MHz
Sim Tissue Temp: 22.0 (Celsius)
Start Power; 250mW

Target at 1W is 11.09 mW/g (1g)
SAR calculated is 11.11 mW/g, Percent from target (including drift) for 1g is + 0.17 %

Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003);Probe Cal Date: 26/02/03ConvF(6.30,6.30,6.30); Crest factor: 1.0; FCC Body 835: σ = 0.97 mho/m ε= 52.5 ρ = 1.00 g/cm3; DAE Cal Date: 02-19-2003
Cubes (2): Peak: 4.69 mW/g ± 0.05 dB, SAR (1g): 2.79 mW/g ± 0.03 dB, SAR (10g): 1.76 mW/g ± 0.03 dB, (Worst-case extrapolation) Penetration depth: 11.9 (9.5, 15.3) [mm]
Power drift: 0.02 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

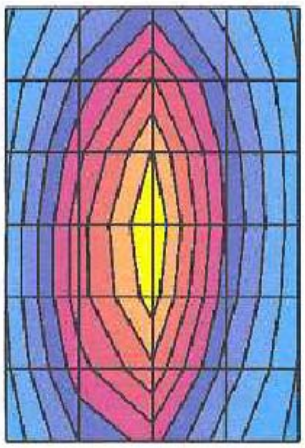
Measured SAR Value: 2.65 mW/g, 1.69 mW/g (10g avg.)
Power Drift: -0.02 dB

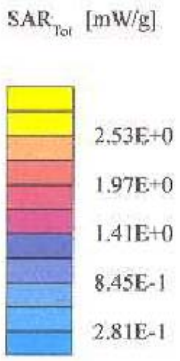
New Target/Measured SAR Value: 10.65 mW/g, 6.79 mW/g (10g avg.)
(normalized to 1.0 W, with drift compensation)

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:	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.)

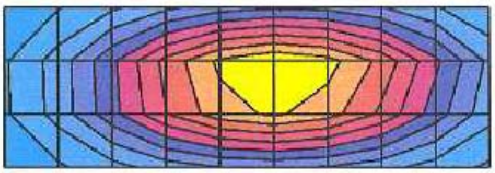
Test performed by: S.Whalen Initial: SW

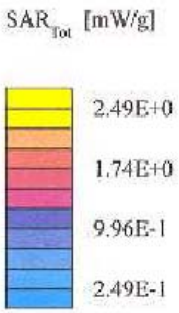
Sys. Per. Chk. Form: 021024

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

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:	1393
Place of Calibration:	Zurich
Date of Calibration:	March 22, 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:	N. Vetterli
Approved by:	Jelenić Katja

DASY3 - Parameters of Probe: ET3DV6 SN:1393

Sensitivity in Free Space

Diode Compression

NormX	1.80 $\mu V/(V/m)^2$	DCP X	95	mV
NormY	1.49 $\mu V/(V/m)^2$	DCP Y	95	mV
NormZ	1.80 $\mu V/(V/m)^2$	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	**7.1** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**7.1** ± 9.5% (k=2)	Alpha **0.32**
	ConvF Z	**7.1** ± 9.5% (k=2)	Depth **2.56**

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	**5.5** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**5.5** ± 9.5% (k=2)	Alpha **0.44**
	ConvF Z	**5.5** ± 9.5% (k=2)	Depth **2.49**

Boundary Effect

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	8.4	4.8
SAR_{be} [%]	With Correction Algorithm	0.3	0.5

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	10.7	7.3
SAR_{be} [%]	With Correction Algorithm	0.2	0.3

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**1.7 ± 0.2**	mm

Schmid & Partner
Engineering AG

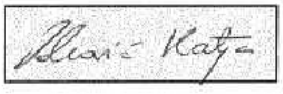
Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1393**
Place of Assessment:	**Zurich**
Date of Assessment:	**April 24, 2002**
Probe Calibration Date:	**March 22, 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: 

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:	**1393**
Place of Assessment:	**Zurich**
Date of Assessment:	**March 25, 2002**
Probe Calibration Date:	**March 22, 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:1393

Conversion factor (± standard deviation)

835 MHz	ConvF	**7.2 ± 8%**	ε_r = **41.5** σ = **0.90 mho/m** (head tissue)
835 MHz	ConvF	**6.9 ± 8%**	ε_r = **55.2** σ = **0.97 mho/m** (body tissue)
900 MHz	ConvF	**6.8 ± 8%**	ε_r = **55.0** σ = **1.05 mho/m** (body tissue)
1800 MHz	ConvF	**5.1 ± 8%**	ε_r = **53.3** σ = **1.52 mho/m** (body tissue)
1950 MHz	ConvF	**4.9 ± 8%**	ε_r = **53.3** σ = **1.52 mho/m** (body tissue)
2450 MHz	ConvF	**4.2 ± 10%**	ε_r = **52.7** σ = **1.95 mho/m** (body tissue)

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

Client Motorola CGISS

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1383
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	February 26, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	8-Mar-02	Mar-03
Power sensor HP 8481A	MY41092180	18-Sep-02	Sep-03
Power meter EPM E4419B	GB41293874	13-Sep-02	Sep-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

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

Date issued: February 26, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

DASY - Parameters of Probe: ET3DV6 SN:1383

Sensitivity in Free Space

Diode Compression

NormX	1.80 $\mu V/(V/m)^2$	DCP X	93	mV
NormY	1.55 $\mu V/(V/m)^2$	DCP Y	93	mV
NormZ	1.62 $\mu V/(V/m)^2$	DCP Z	93	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	**6.5** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**6.5** ± 9.5% (k=2)	Alpha **0.59**
	ConvF Z	**6.5** ± 9.5% (k=2)	Depth **1.97**
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	**5.2** ± 9.5% (k=2)	Boundary effect:
	ConvF Y	**5.2** ± 9.5% (k=2)	Alpha **0.57**
	ConvF Z	**5.2** ± 9.5% (k=2)	Depth **2.54**

Boundary Effect

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	10.0	5.2
SAR_{be} [%]	With Correction Algorithm	0.1	0.5

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

Probe Tip to Boundary		1 mm	2 mm
SAR_{be} [%]	Without Correction Algorithm	15.1	9.9
SAR_{be} [%]	With Correction Algorithm	0.2	0.0

Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**0.5 ± 0.2**	mm

Dosimetric E-Field Probe ET3DV6 SN:1383

Conversion factor (± standard deviation)

150 MHz	ConvF	8.1 ± 8%	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
236 MHz	ConvF	7.9 ± 8%	ε_r = 59.8 σ = 0.87 mho/m (body tissue)
300 MHz	ConvF	7.8 ± 8%	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
350 MHz	ConvF	7.8 ± 8%	ε_r = 57.7 σ = 0.93 mho/m (body tissue)
450 MHz	ConvF	7.5 ± 8%	ε_r = 56.7 σ = 0.94 mho/m (body tissue)
784 MHz	ConvF	6.5 ± 8%	ε_r = 55.4 σ = 0.97 mho/m (body tissue)
1450 MHz	ConvF	5.3 ± 8%	ε_r = 54.0 σ = 1.30 mho/m (body tissue)

Dosimetric E-Field Probe ET3DV6 SN:1383

Conversion factor (± standard deviation)

150 MHz ✓	ConvF	9.0 ± 8%	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
236 MHz ✓	ConvF	8.2 ± 8%	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz ✓	ConvF	7.7 ± 8%	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz ✓	ConvF	7.7 ± 8%	ε_r = 44.7 σ = 0.87 mho/m (head tissue)
400 MHz ✓	ConvF	7.5 ± 8%	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz ✓	ConvF	7.5 ± 8%	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz ✓	ConvF	6.7 ± 8%	ε_r = 41.8 σ = 0.90 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.

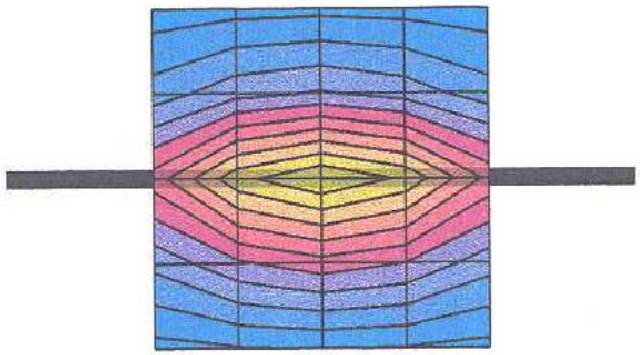
9. Power Test

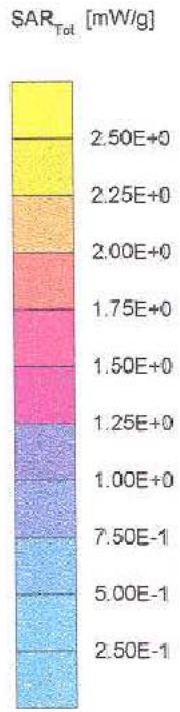
After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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



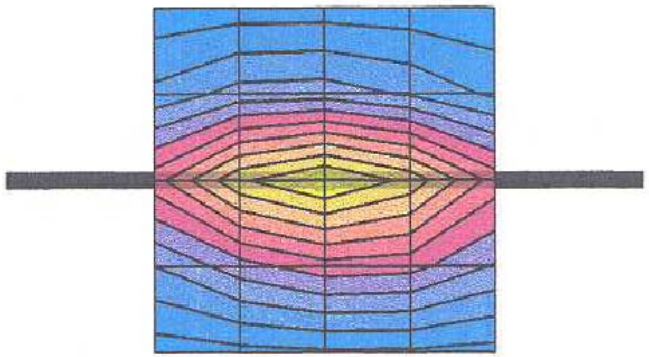


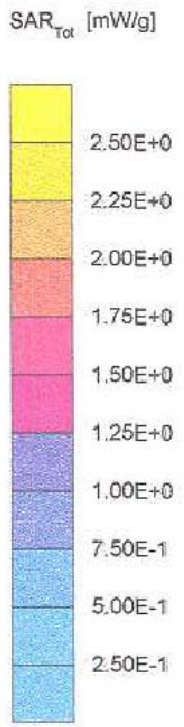
Schmid & Partner Engineering AG, Zurich, Switzerland

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





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:	Adrian Kaft

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.

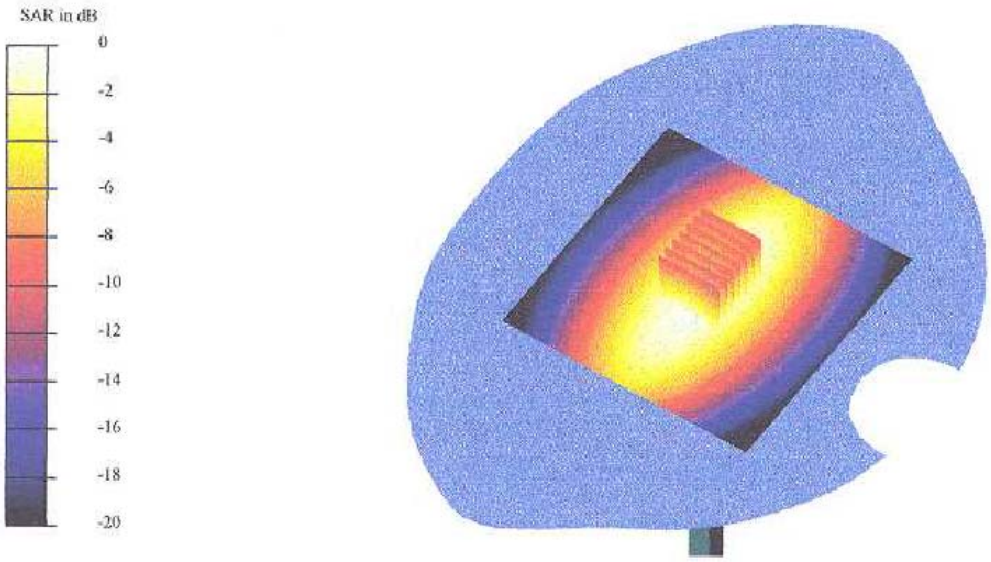
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN427_SN1507_HSL835_151002.da4

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



APPENDIX E
Illustration of Body-Worn Accessories

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT7007. 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

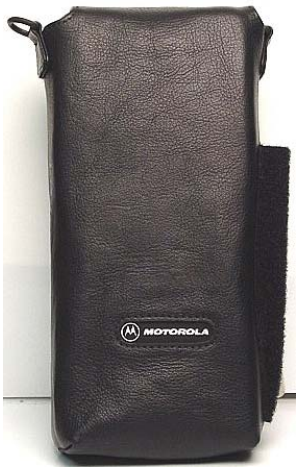


Photo 2.
Model FHN6394A
Front View

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