



**MOTOROLA**



Certificate Number: 1449-01

**FCC ID: AZ489FT7016  
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 4 of 4**

**Government & Enterprise Mobility Solutions  
EME Test Laboratory  
8000 West Sunrise Blvd  
Fort Lauderdale, FL. 33322**

**Date of Report:** 3/20/06  
**Report Revision:** A  
**Report ID:** WDE1000\_Rev A\_060320\_SR3388

**Responsible Engineer:** Kim Uong (EME lead Eng.)  
**Date/s Tested:** 2/13/06 – 3/10/06  
**Manufacturer/Location:** Motorola South Israel  
**Sector/Group/Div.:** MCIL Israel  
**Date submitted for test:** 1/26/06  
**DUT Description:** WDE1000 (Wireless Device Enabler) with 2 transmitters:  
802.11a@4.9GHz and 802.11b/g @ 2.4GHz  
**Test TX mode(s):** CW  
**Max. Power output:** 0.126W for 4.94-4.99GHz; 0.079W for 2400-2483.5MHz  
**Nominal Power:** 0.1Watt for 4.94-4.99GHz; 0.063W for 2400-2483.5MHz  
**Tx Frequency Bands:** 4942.5-4987.5MHz (5MHz step size) ;  
2412-2462MHz (5MHz step size)  
**Signaling type:** OFDM @4.9GHz; DSSS and OFDM @ 2.4GHz  
**Model(s) Tested:** F2889A  
**Model(s) Certified:** F2889A  
**Serial Number(s):** 537SGA0057, 537SGA0060  
**Classification:** General Population/Uncontrolled  
**Rule Part(s):** 15 & 90



**Approved Accessories:**  
**Antenna(s):**  
6487848V60 PIFA (on board ant) 2400-2483.5MHz 1/4Wave ; 2.5dBi gain  
6487848V61 PIFA (on board ant) 4.94-4.99GHz 1/4Wave; 3.3dBi gain

**Max. Calc. 1-g/10-g Avg. SAR: 0.43/0.24 W/kg (Body)**

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. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

This reporting format is consistent with the test report guidelines of the TIA TSB-150 December 2004  
The results and statements contained in this report pertain only to the device(s) evaluated.

*Signature on file- Ken Enger*  
**Ken Enger GEMS EME Lab Senior Resource Manager,  
Laboratory Director,**

**Approval Date: 3/20/06**

**Certification Date: 03/17/06**  
**Certification No.: L1060363P**

## **Appendix D**

### **Test System Verification Scans**

Note: Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The GEMS EME lab validated the dipole to the applicable IEEE system performance targets. Within 24 hours system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the GEMS EME system performance validation are provided herein. To assess the isotropic characteristics of the measurement probe, two system performance zoom scans (0 and 90 degrees) were measured. The results were averaged together and adjusted to account for the power drift in order to obtain the final calculated 1 and 10 gram results.

**Motorola GEMS EME Lab**

**SPEAG Dipole 2450 MHz;** Model #: D2450V2 S/N: 703; Test Date: 2/13/06

Run #: CM-SYSP-2450B-060213-02

Sim.Tissue Temp: 20.1 (C)

TX Freq: 2450 (MHz) Start power: 70 (mW)

Target: 51.98 mW/g for 1g SAR 24.13 mW/g for 10g SAR

56.50 mW/g calculated 1g-SAR; 8.70 % from target (including drift)

25.90 mW/g calculated 10g-SAR; 7.35 % from target (including drift)

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),

Duty Cycle: 1:1, Medium: 2450 FCC Body, Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.03$  mho/m;  $\epsilon_r = 52.2$ ;  $\tilde{n} = 1000$  kg/m<sup>3</sup> ; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm

Reference Value = 47.5 V/m; Power Drift = 0.0163 dB

Peak SAR (extrapolated) = 9.23 W/kg

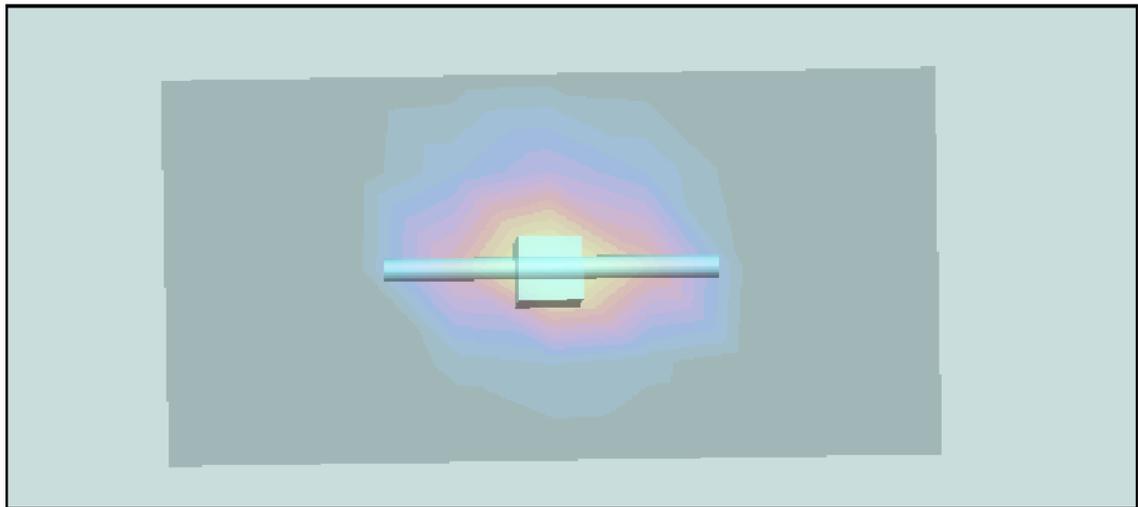
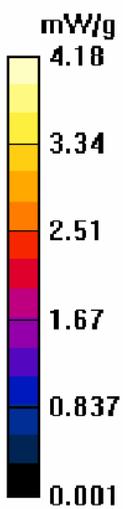
**SAR(1 g) = 3.98 mW/g; SAR(10 g) = 1.82 mW/g**

**System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm

Reference Value = 47.5 V/m; Power Drift = 0.0163 dB

Peak SAR (extrapolated) = 9.18 W/kg

**SAR(1 g) = 3.96 mW/g; SAR(10 g) = 1.82 mW/g**



**Motorola GEMS EME Lab**

**SPEAG Dipole 2450 MHz;** Model #: D2450V2 S/N: 703; Test Date: 2/15/06

Run #: ErC-SYSP-2450B-060215-01

Sim.Tissue Temp: 21.3 (C)

TX Freq: 2450 (MHz) Start power: 50 (mW)

Target: 51.98 mW/g for 1g SAR 24.13 mW/g for 10g SAR

55.15 mW/g calculated 1g-SAR; 6.10 % from target (including drift)

25.43 mW/g calculated 10g-SAR; 5.39 % from target (including drift)

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),

Duty Cycle: 1:1, Medium: 2450 FCC Body, Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.96$  mho/m;  $\epsilon_r = 51$ ;  $n = 1000$

kg/m<sup>3</sup>; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm

Reference Value = 42.2 V/m; Power Drift = 0.0119 dB

Peak SAR (extrapolated) = 6.39 W/kg

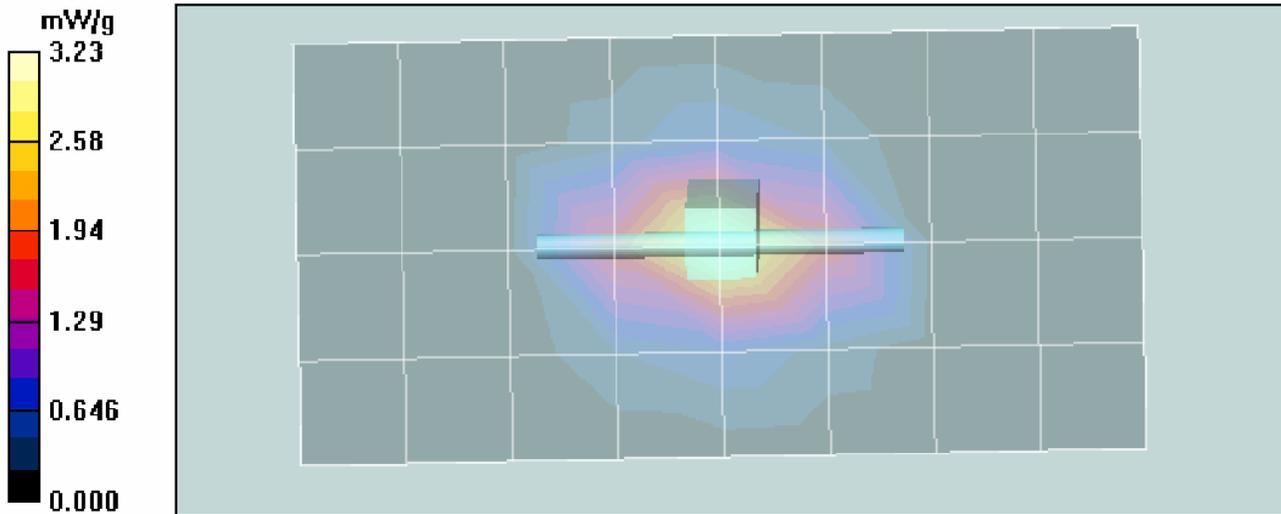
**SAR(1 g) = 2.78 mW/g; SAR(10 g) = 1.28 mW/g**

**System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm

Reference Value = 42.2 V/m; Power Drift = 0.0119 dB

Peak SAR (extrapolated) = 6.34 W/kg

**SAR(1 g) = 2.75 mW/g; SAR(10 g) = 1.27 mW/g**



**Motorola GEMS EME Lab**

**SPEAG Dipole 2450 MHz;** Model #: D2450V2 S/N: 704; Test Date: 3/09/06

Run #: HvH-SYSP-2450B-060309-01

Sim.Tissue Temp: 20.7 (C)

TX Freq: 2450 (MHz)                      Start power: 50 (mW)

Target: 56.12 mW/g for 1g SAR 25.68 mW/g for 10g SAR  
58.71 mW/g calculated 1g-SAR 4.62 % from target (including drift)  
26.74 mW/g calculated 10g-SAR 4.14 % from target (including drift)

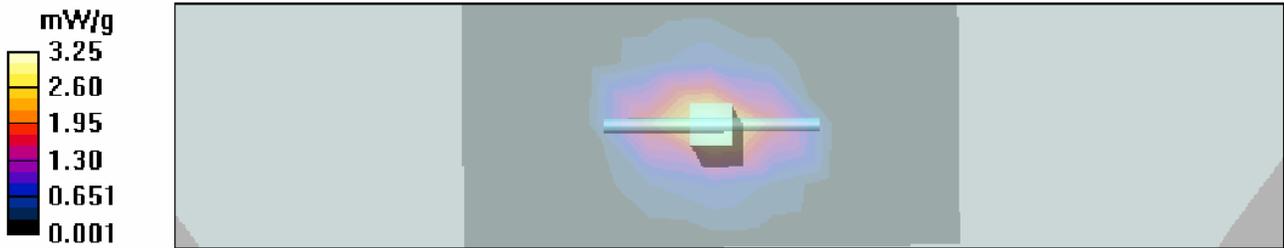
Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),  
Duty Cycle: 1:1, Medium: 2450 FCC Body, Medium parameters used: f = 2450 MHz;  $\sigma$  = 2.03 mho/m;  $\epsilon_r$  = 51.8;  $\tilde{n}$  = 1000  
kg/m<sup>3</sup> ; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm  
Reference Value = 41.8 V/m; Power Drift = -0.0232 dB

Peak SAR (extrapolated) = 6.92 W/kg  
**SAR(1 g) = 2.93 mW/g; SAR(10 g) = 1.33 mW/g**

**System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm,dz=5mm  
Reference Value = 41.8 V/m; Power Drift = -0.0232 dB

Peak SAR (extrapolated) = 6.81 W/kg  
**SAR(1 g) = 2.91 mW/g; SAR(10 g) = 1.33 mW/g**



**Motorola GEMS EME Lab**

**SPEAG Dipole 5000 MHz;** Model #: D5GHZV2 S/N: 1017; Test Date: 2/20/06

Run #: ErC SYSP 5000B 060220-03

Sim.Tissue Temp: 21.6 (C)

TX Freq: 5000 (MHz) Start power: 50 (mW)

Validation Target: 67.78 mW/g for 1g SAR 19.42 mW/g for 10g SAR

67.78 mW/g calculated 1g-SAR; 0 % from target (including drift)

19.42 mW/g calculated 10g-SAR; 0 % from target (including drift)

Probe: EX3DV3 - SN3510, Calibrated: 2/24/2005, ConvF(4.42, 4.42, 4.42),

Duty Cycle: 1:1, Medium: FCC Body 5000 MHz, Medium parameters used:  $f = 5000$  MHz;  $\sigma = 5.26$  mho/m;  $\epsilon_r = 48$ ;  $n = 1000$  kg/m<sup>3</sup> ; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**HF-System Performance Check/0-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 26.0 V/m; Power Drift = -0.0505 dB

Peak SAR (extrapolated) = 12.4 W/kg

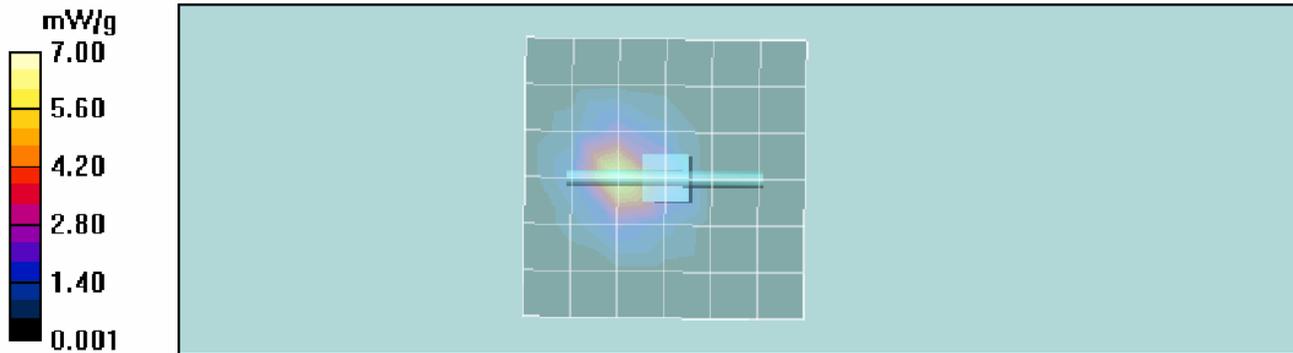
**SAR(1 g) = 3.38 mW/g; SAR(10 g) = 0.965 mW/g**

**HF-System Performance Check/90-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 26.0 V/m; Power Drift = -0.0505 dB

Peak SAR (extrapolated) = 11.9 W/kg

**SAR(1 g) = 3.32 mW/g; SAR(10 g) = 0.955 mW/g**



**Motorola GEMS EME Lab**

**SPEAG Dipole 5000 MHz;** Model #: D5GHzV2 S/N: 1017; Test Date: 2/22/06

Run #: ErC SYSP 5000B 060222-02

Sim.Tissue Temp: 21.0 (C)

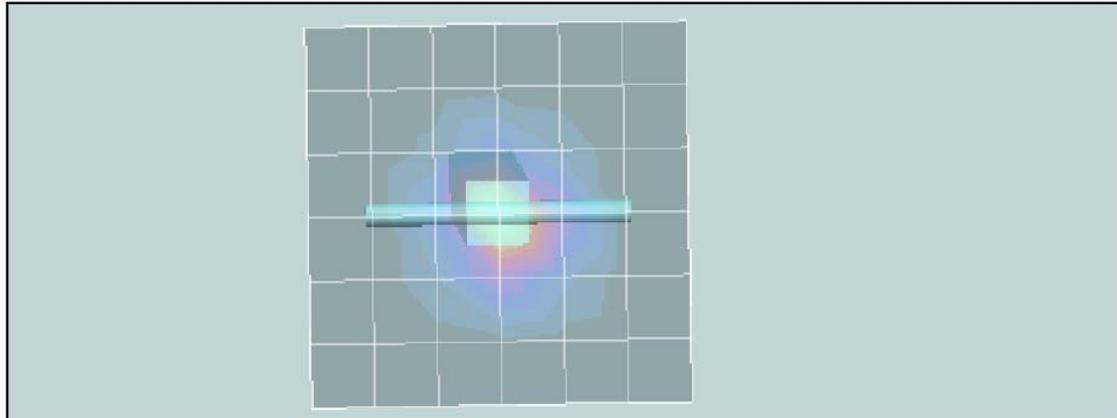
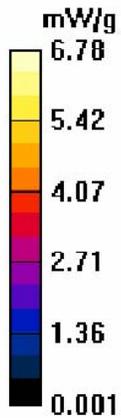
TX Freq: 5000 (MHz)                      Start power: 50 (mW)

Validation Target: 67.78 mW/g for 1g SAR 19.42 mW/g for 10g SAR  
68.24 mW/g calculated 1g-SAR; 0.68 % from target (including drift)  
19.25 mW/g calculated 10g-SAR; -0.90 % from target (including drift)

Probe: EX3DV3 - SN3510, Calibrated: 2/24/2005, ConvF(4.42, 4.42, 4.42),  
Duty Cycle: 1:1, Medium: FCC Body 5000 MHz, Medium parameters used:  $f = 5000$  MHz;  $\sigma = 5.19$  mho/m;  $\epsilon_r = 48.1$ ;  $\bar{n} = 1000$  kg/m<sup>3</sup> ;Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**HF-System Performance Check/0-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm  
Reference Value = 38.2 V/m; Power Drift = -0.0925 dB  
Peak SAR (extrapolated) = 12.0 W/kg  
**SAR(1 g) = 3.21 mW/g; SAR(10 g) = 0.904 mW/g**

**HF-System Performance Check/90-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm  
Reference Value = 38.2 V/m; Power Drift = -0.0925 dB  
Peak SAR (extrapolated) = 12.9 W/kg  
**SAR(1 g) = 3.47 mW/g; SAR(10 g) = 0.979 mW/g**



SYSTEM VALIDATION

Date:	<u>3/8/2006</u>	Frequency (MHz):	<u>2450</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>IEEE head</u>
Robot System:	<u>GEMS-2</u>	Ambient Temp.(°C):	<u>22.4</u>
Probe Serial #:	<u>1547</u>	Tissue Temp.(°C):	<u>20.3</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics

Permittivity:	<u>38.3</u>	Phantom Type/SN:	<u>40302002A-S11</u>
Conductivity:	<u>1.86</u>	Distance (mm):	<u>10</u>

Reference Source:	<u>Dipole</u>	(Dipole)
Reference SN:	<u>704</u>	

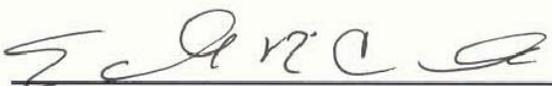
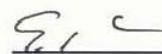
Power to Dipole:	<u>50</u>	mW
Power Output (radio):	<u>n/a</u>	mW

Target SAR Value:	<u>52.40</u>	mW/g,	<u>24.00</u>	mW/g (10g avg.)
(normalized to 1.0 W)				

Measured SAR Value:	<u>2.88</u>	mW/g,	<u>1.325</u>	mW/g (10g avg.)
Power Drift:	<u>0.0518</u>	dB		

Measured SAR Value:	<u>56.92</u>	mW/g,	<u>26.19</u>	mW/g (10g avg.)
(normalized to 1.0 W, including drift)				

Percent Difference From Target (MUST be within System Uncertainty):	<u>8.62%</u>	(1g ave)
	<u>9.11%</u>	(10g ave)

Test performed by:  Initial: 

**DUT: Dipole 2450 MHz;**

Run #: ErC VAL 2450 H 060308-01      Sim.Tissue Temp: 20.3 (C)  
 Robot: GEMS-2      Phantom #: 40302002A-S11  
 Model #: D2450V2      S/N: 704  
 TX Freq: 2450(MHz)      Start power: 50 (mW)

**New Targets:**

56.92 mW/g for 1g SAR      26.19 mW/g for 10g SAR  
 56.92 mW/g calculated 1g-SAR;    0 % from target (including drift)  
 26.19 mW/g calculated 10g-SAR;    0 % from target (including drift)

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.22, 4.22, 4.22),

Duty Cycle: 1:1, Medium: 2450 IEEE Head, Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.86$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**System Performance/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 44.0 V/m; Power Drift = 0.0518 dB

Peak SAR (extrapolated) = 6.30 W/kg

SAR(1 g) = 2.88 mW/g; SAR(10 g) = 1.32 mW/g

Maximum value of SAR (measured) = 3.16 mW/g

**System Performance/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 44.0 V/m; Power Drift = 0.0518 dB

Peak SAR (extrapolated) = 6.26 W/kg

SAR(1 g) = 2.88 mW/g; SAR(10 g) = 1.33 mW/g

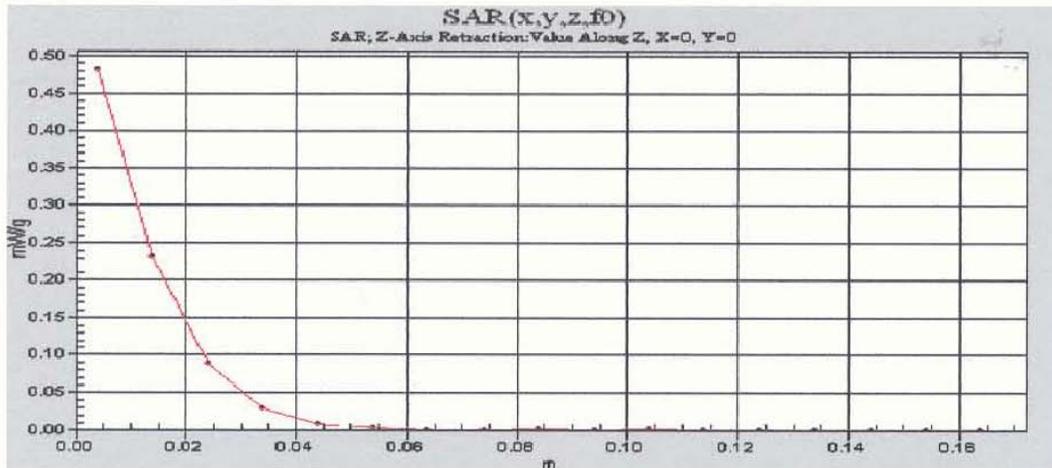
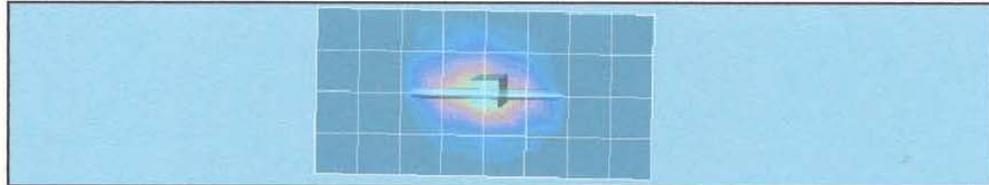
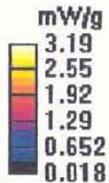
Maximum value of SAR (measured) = 3.19 mW/g

**System Performance/Dipole Area Scan (5x9x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.20 mW/g

**System Performance/Z-Axis Retraction (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 0.483 mW/g



**SYSTEM PERFORMANCE CHECK TARGET SAR**

Date:	<u>03/08/06</u>	Frequency (MHz):	<u>2450</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>FCC Body</u>
Robot System:	<u>GEMS-2</u>	Ambient Temp.(°C):	<u>22.3</u>
Probe Serial #:	<u>1547</u>	Tissue Temp.(°C):	<u>20.9</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics

Permittivity:	<u>51.2</u>	Phantom Type/SN:	<u>40302002B-S12</u>
Conductivity:	<u>2.02</u>	Distance (mm):	<u>10</u>

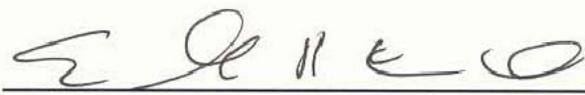
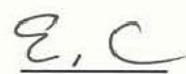
Reference Source: Dipole (Dipole)  
 Reference SN: 704

Power to Dipole: 250 mW

Measured SAR Value: 14.05 mW/g, 6.43 mW/g (10g avg.)  
 Power Drift: 0.00611 dB

New Target/Measured

SAR Value: 56.12 mW/g, 25.68 mW/g (10g avg.)  
 (normalized to 1.0 W, including drift)

Test performed by:  Initial: 

**DUT: Dipole 2450 MHz;**

Run #: ErC VAL 2450 B 060307-01      Sim.Tissue Temp: 20.9 (C)  
 Robot: GEMS-2      Phantom #: 40302002B-S12  
 Model #: D2450V2      S/N: 704  
 TX Freq: 2450(MHz)      Start power: 250 (mW)

New Targets:  
 56.12 mW/g for 1g SAR      25.68 mW/g for 10g SAR  
 56.12 mW/g calculated 1g-SAR;    0 % from target (including drift)  
 25.68 mW/g calculated 10g-SAR;    0 % from target (including drift)

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),  
 Duty Cycle: 1:1, Medium: 2450 FCC Body, Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.02$  mho/m;  $\epsilon_r = 51.2$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
 Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**System Performance/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 91.0 V/m; Power Drift = 0.00611 dB  
 Peak SAR (extrapolated) = 32.9 W/kg  
**SAR(1 g) = 14.2 mW/g; SAR(10 g) = 6.48 mW/g**  
 Maximum value of SAR (measured) = 15.3 mW/g

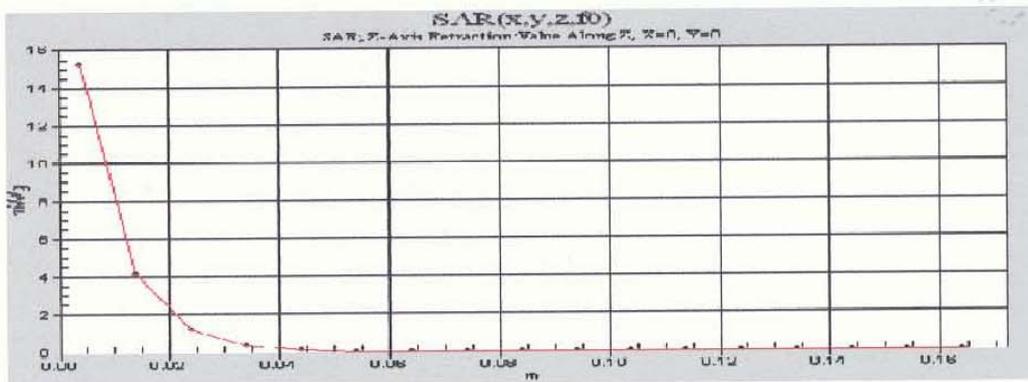
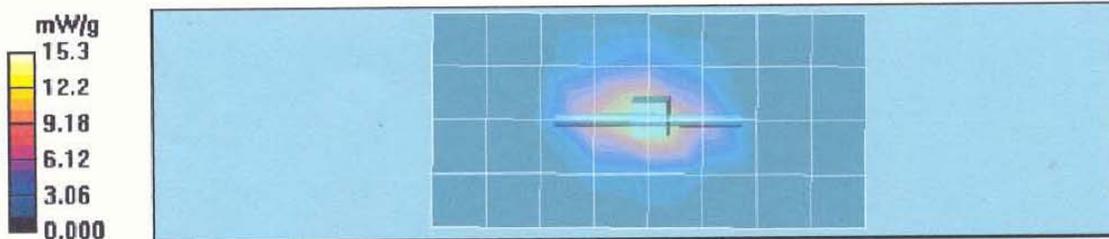
**System Performance/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 91.0 V/m; Power Drift = 0.00611 dB  
 Peak SAR (extrapolated) = 31.8 W/kg  
**SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.38 mW/g**  
 Maximum value of SAR (measured) = 15.1 mW/g

**System Performance/Dipole Area Scan (5x9x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 15.2 mW/g

**System Performance/Z-Axis Retraction (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm



**SYSTEM VALIDATION**

Date:	<u>2/17/2005</u>	Frequency (MHz):	<u>2450</u>
Lab Location:	<u>CGISS</u>	Mixture Type:	<u>IEEE Head</u>
Robot System:	<u>CGISS-3</u>	Ambient Temp.(°C):	<u>22.1</u>
Probe Serial #:	<u>1545</u>	Tissue Temp.(°C):	<u>21.6</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics

Permittivity:	<u>37.9</u>	Phantom Type/SN:	<u>40302002B-S10</u>
Conductivity:	<u>1.89</u>	Distance (mm):	<u>10</u>

Reference Source:	<u>Diploe</u>	(Dipole/Handset)
Reference SN:	<u>703</u>	

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

Target SAR Value: 52.4 mW/g, 24 mW/g (10g avg.)  
 (normalized to 1.0 W)

Measured SAR Value: 13.5 mW/g, 6.29 mW/g (10g avg.)  
 Power Drift: 0.0354 dB

Measured SAR Value: 53.56 mW/g, 24.96 mW/g (10g avg.)  
 (normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty): 2.22 % (1g ave)  
3.98 % (10g ave)

Test performed by: E. Church Initial: EC

**DUT: Dipole 2450 MHz**

Run #: 050217-04 Test operator: E. Church  
 Robot: CGISS-3 Phantom #: 40302002B-S10 Sim Tissue Temp: 21.6 (C)  
 Model #: D2450V2 SN: 703  
 TX Freq: 2450 MHz Start power: 250 mW

**Target**

	<b>53.56 mW/g for 1g SAR</b>	<b>24.96 mW/g for 10g SAR</b>
SAR calculated 1g is	13.5 mW/g;	0 % from target (including drift)
SAR calculated 10g is	6.29 mW/g;	0 % from target (including drift)

Probe: ET3DV6 - SN1545, Calibrated: 9/1/2004, ConvF(4.12, 4.12, 4.12),  
 Duty Cycle: 1:1, Medium: 2450 Head, Medium parameters used:  $\sigma = 1.89$ ; mho/m,  $\epsilon_r = 37.9$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
 Electronics: DAE3 Sn401, Calibrated: 8/25/2004

**Sys Validation Head 2450 MHz/Area Scan (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 93.4 V/m; Power Drift = 0.0354 dB  
**Motorola Fast SAR: SAR(1 g) = 13.2 mW/g; SAR(10 g) = 5.95 mW/g**  
 Maximum value of SAR (interpolated) = 16.3 mW/g

**Sys Validation Head 2450 MHz/Z Scan (1x1x16):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

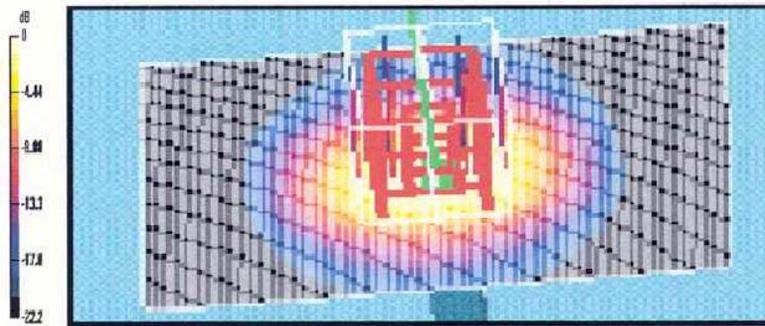
Maximum value of SAR (measured) = 15 mW/g

**Sys Validation Head 2450 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

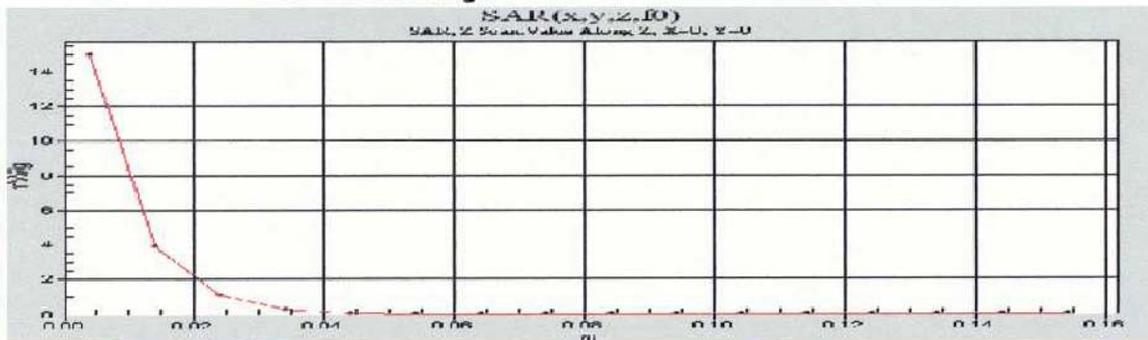
Reference Value = 93.4 V/m; Power Drift = 0.0354 dB  
 Peak SAR (extrapolated) = 27.3 W/kg  
**SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.2 mW/g**

**Sys Validation Head 2450 MHz/Zoom Scan 2 (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 93.4 V/m; Power Drift = 0.0354 dB  
 Peak SAR (extrapolated) = 28.4 W/kg  
**SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.38 mW/g**  
 Maximum value of SAR (measured) = 15.3 mW/g



0 dB = 15.3mW/g



**SYSTEM PERFORMANCE CHECK TARGET SAR**

Date:	<u>2/17/2005</u>	Frequency (MHz):	<u>2450</u>
Lab Location:	<u>GEMS</u>	Mixture Type:	<u>FCC Body</u>
Robot System:	<u>GEMS-3</u>	Ambient Temp.(°C):	<u>22.1</u>
Probe Serial #:	<u>1545</u>	Tissue Temp.(°C):	<u>21.7</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics

Permittivity:	<u>51.1</u>	Phantom Type/SN:	<u>40302002A-S6</u>
Conductivity:	<u>2.01</u>	Distance (mm):	<u>10</u>

Reference Source: Dipole (Dipole)  
Reference SN: 703

Power to Dipole: 250 mW

Measured SAR Value: 13 mW/g, 6.035 mW/g (10g avg.)  
Power Drift: 0.00203 dB

New Target/Measured

SAR Value: 51.98 mW/g, 24.13 mW/g (10g avg.)  
(normalized to 1.0 W, including drift)

Test performed by: E. Church Initial: ERC

**DUT: Dipole 2450 MHz**

Run #: 050217-01      Test operator: E. Church  
 Robot: CGISS-3      Phantom #: 40302002A-S6      Sim Tissue Temp: 21.5 (C)  
 Model #: D2450V2      SN: 703  
 TX Freq: 2450 MHz      Start power: 250 mW

**Target**

<b>51.98 mW/g for 1g SAR</b>	<b>23.05 mW/g for 10g SAR</b>
SAR calculated 1g is 13 mW/g;	0 % from target (including drift)
SAR calculated 10g is 5.765 mW/g;	0 % from target (including drift)

Probe: ET3DV6 - SN1545, Calibrated: 9/1/2004, ConvF(3.95, 3.95, 3.95),  
 Duty Cycle: 1:1, Medium: Body 2450, Medium parameters used:  $\sigma = 2.01$ ; mho/m,  $\epsilon_r = 51.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
 Electronics: DAE3 Sn401, Calibrated: 8/25/2004

**Sys Validation Body 2450 MHz/Area Scan (51x81x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 86.8 V/m; Power Drift = 0.00203 dB  
**Motorola Fast SAR: SAR(1 g) = 13 mW/g; SAR(10 g) = 5.58 mW/g**  
 Maximum value of SAR (interpolated) = 17.3 mW/g

**Sys Validation Body 2450 MHz/Z Scan (1x1x16):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

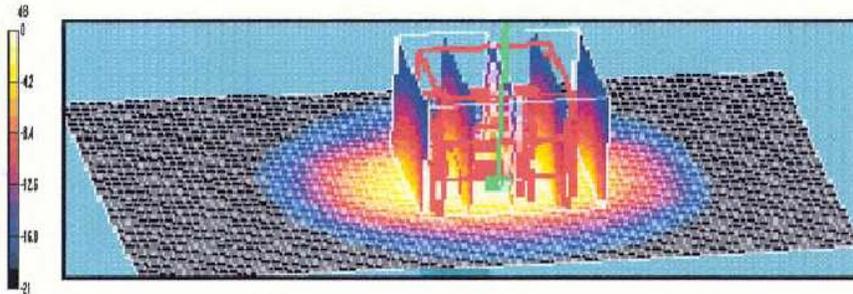
Maximum value of SAR (measured) = 14.2 mW/g

**Sys Validation Body 2450 MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

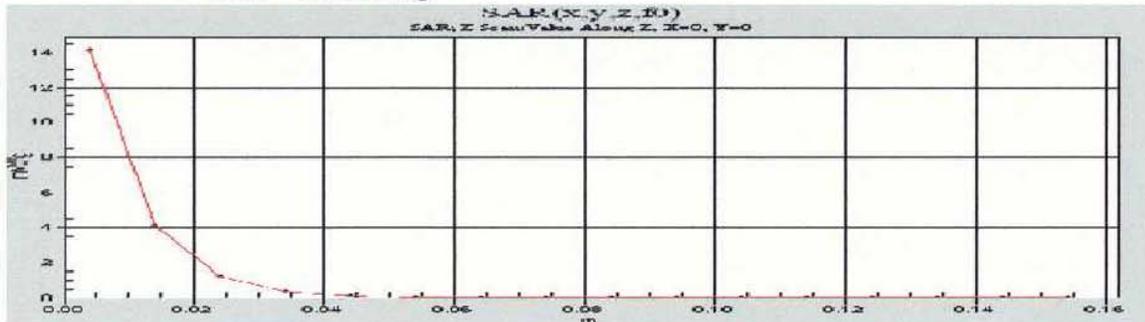
Reference Value = 86.8 V/m; Power Drift = 0.00203 dB  
 Peak SAR (extrapolated) = 28 W/kg  
**SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.95 mW/g**

**Sys Validation Body 2450 MHz/Zoom Scan 2 (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 86.8 V/m; Power Drift = 0.00203 dB  
 Peak SAR (extrapolated) = 28.8 W/kg  
**SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.12 mW/g**  
 Maximum value of SAR (measured) = 14.6 mW/g



0 dB = 14.6mW/g



SYSTEM VALIDATION

Date:	<u>2/20/2006</u>	Frequency (MHz):	<u>5000</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>IEEE Head</u>
Robot System:	<u>GEMS-2</u>	Ambient Temp.(°C):	<u>22.3</u>
Probe Serial #:	<u>3510</u>	Tissue Temp.(°C):	<u>20.9</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics			
Permittivity:	<u>38.4</u>	Phantom Type/SN:	<u>40302002A-S11</u>
Conductivity:	<u>4.82</u>	Distance (mm):	<u>10</u>

Reference Source:	<u>Dipole</u>	(Dipole)
Reference SN:	<u>1017</u>	

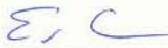
Power to Dipole:	<u>50</u> mW	Targets from DASYS 4 Manual pg 26-5 Uncertainty for over 3 GHz is 11%
Power Output (radio):	<u>n/a</u> mW	

Target SAR Value:	<u>72.90</u> mW/g,	<u>20.70</u> mW/g (10g avg.)
(normalized to 1.0 W)		

Measured SAR Value:	<u>3.32</u> mW/g,	<u>0.945</u> mW/g (10g avg.)
Power Drift:	<u>-0.0746</u> dB	

Measured SAR Value:	<u>67.55</u> mW/g,	<u>19.23</u> mW/g (10g avg.)
(normalized to 1.0 W, including drift)		

Percent Difference From Target (MUST be within System Uncertainty):	<u>-7.34%</u> (1g ave)
	<u>-7.11%</u> (10g ave)

Test performed by:  Initial: 

**DUT: Dipole 5000 MHz;**

Run #: ErC-Val 5000H 060220-02  
 Robot GEMS-2  
 Model #: D5GHzV2  
 TX Freq: 5000 (MHz)  
 New Target:

Sim.Tissue Temp: (C) 20.9  
 Phantom #: 40302002A-S11  
 S/N: 1017  
 Start power: 50 (mW)

67.55 mW/g for 1g SAR                      19.23 mW/g for 10g SAR  
 67.55 mW/g calculated 1g-SAR;            0 % from target (including drift)  
 19.53 mW/g calculated 10g-SAR;         0 % from target (including drift)

Probe: EX3DV3 - SN3510, Calibrated: 2/24/2005, ConvF(5.11, 5.11, 5.11),  
 Duty Cycle: 1:1, Medium: IEEE Head 5000 MHz, Medium parameters used: f = 5000 MHz;  $\sigma = 4.78$  mho/m;  $\epsilon_r = 37.9$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
 Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**HF-System Performance Check/0-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 37.6 V/m; Power Drift = -0.0746 dB  
 Peak SAR (extrapolated) = 13.4 W/kg  
**SAR(1 g) = 3.3 mW/g; SAR(10 g) = 0.938 mW/g**  
 Maximum value of SAR (measured) = 5.87 mW/g

**HF-System Performance Check/90-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

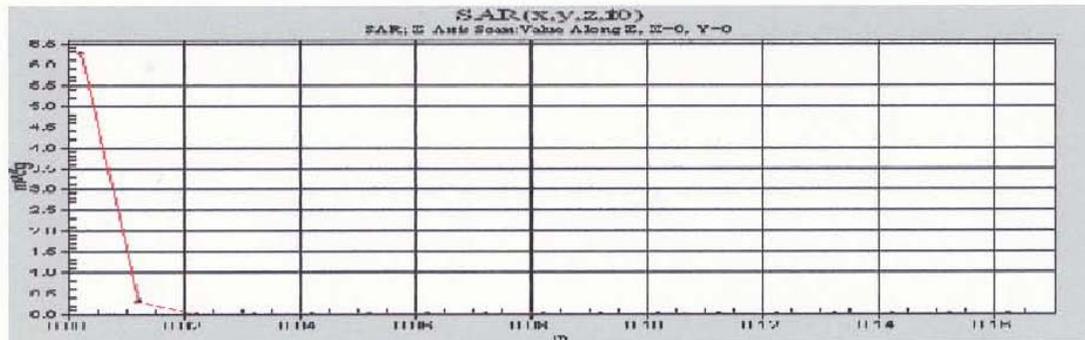
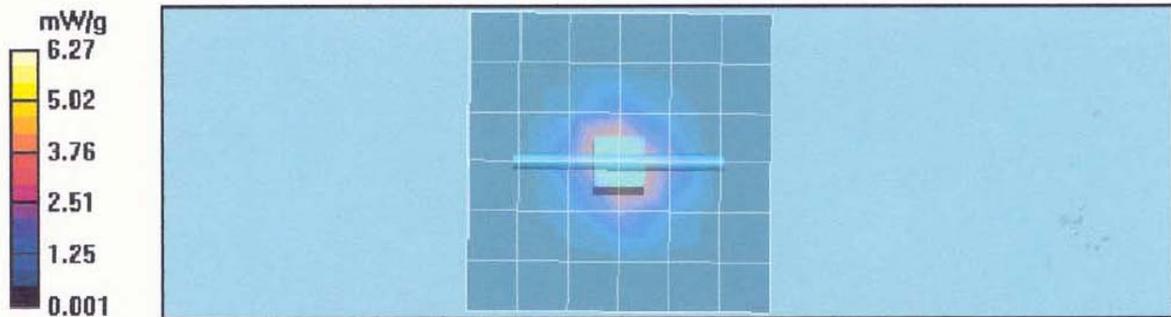
Reference Value = 37.6 V/m; Power Drift = -0.0746 dB  
 Peak SAR (extrapolated) = 13.4 W/kg  
**SAR(1 g) = 3.34 mW/g; SAR(10 g) = 0.951 mW/g**  
 Maximum value of SAR (measured) = 5.99 mW/g

**HF-System Performance Check/Dipole Area Scan (7x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 6.32 mW/g

**HF-System Performance Check/Z-Axis Scan (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 6.27 mW/g



**SYSTEM PERFORMANCE CHECK TARGET SAR**

Date:	<u>02/20/06</u>	Frequency (MHz):	<u>5000</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>FCC Body</u>
Robot System:	<u>GEMS-2</u>	Ambient Temp.(°C):	<u>22</u>
Probe Serial #:	<u>3510</u>	Tissue Temp.(°C):	<u>21.6</u>
DAE Serial #:	<u>401</u>		

Tissue Characteristics

Permittivity:	<u>48.5</u>	Phantom Type/SN:	<u>40302002B-S12</u>
Conductivity:	<u>5.37</u>	Distance (mm):	<u>10</u>

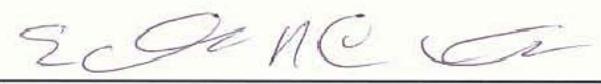
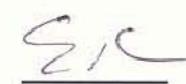
Reference Source: Dipole (Dipole)  
 Reference SN: 1017

Power to Dipole: 50 mW  
 Targets from SPEAG 10 and 1 g cubes 76.1 & 21.8  
 Uncertainty for over 3 GHz is 11%

Measured SAR Value: 3.35 mW/g, 0.96 mW/g (10g avg.)  
 Power Drift: -0.0505 dB

New Target/Measured

SAR Value: 67.78 mW/g, 19.42 mW/g (10g avg.)  
 (normalized to 1.0 W, including drift)

Test performed by:  Initial: 

**DUT: Dipole 5000 MHz;**

Run #: ErC Val 5000B 060220-03  
 Robot GEMS-2  
 Model #: D5GHzV2  
 TX Freq: 5000 (MHz)  
 New Validation Target:

Sim.Tissue Temp: (C) 21.6  
 Phantom #: 40302002B-S12  
 S/N: 1017  
 Start power: 50 (mW)

67.78 mW/g for 1g SAR	19.42 mW/g for 10g SAR
67.78 mW/g calculated 1g-SAR;	0 % from target (including drift)
19.42 mW/g calculated 10g-SAR;	0 % from target (including drift)

Probe: EX3DV3 - SN3510, Calibrated: 2/24/2005, ConvF(4.42, 4.42, 4.42),

Duty Cycle: 1:1, Medium: FCC Body 5000 MHz, Medium parameters used:  $f = 5000$  MHz;  $\sigma = 5.26$  mho/m;  $\epsilon_r = 48$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**HF-System Performance Check/0-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 26.0 V/m; Power Drift = -0.0505 dB

Peak SAR (extrapolated) = 12.4 W/kg

SAR(1 g) = 3.38 mW/g; SAR(10 g) = 0.965 mW/g

Maximum value of SAR (measured) = 6.43 mW/g

**HF-System Performance Check/90-Degree Cube (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 26.0 V/m; Power Drift = -0.0505 dB

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 3.32 mW/g; SAR(10 g) = 0.955 mW/g

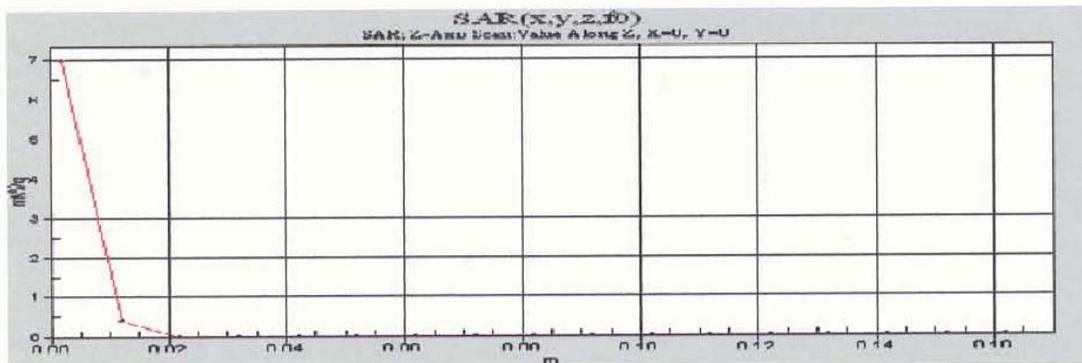
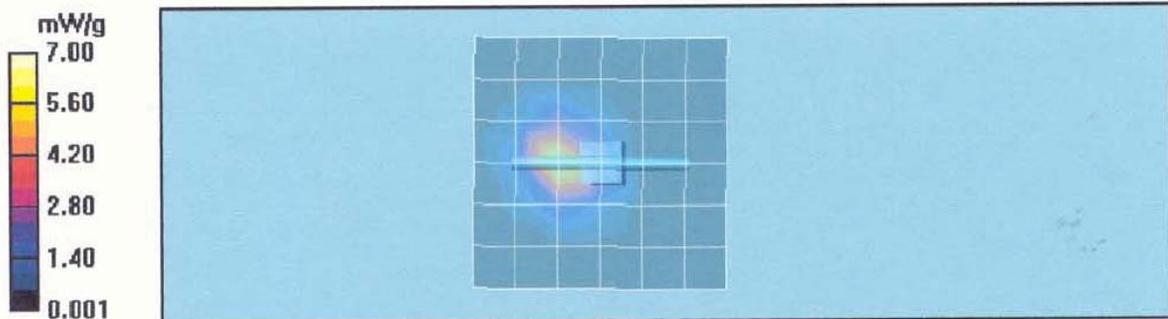
Maximum value of SAR (measured) = 6.39 mW/g

**HF-System Performance Check/Dipole Area Scan (7x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 6.86 mW/g

**HF-System Performance Check/Z-Axis Scan (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 7.00 mW/g



**Appendix E**  
**DUT Scans**  
**(Shortened scan, Highest SAR configurations, and Rough Coarse scan)**

**Shorten scan**

Motorola GEMS EME Laboratory

Model #: F2889A, SN: 537SGA0057; Test Date: 3/9/06

Run #: CM-Ab-060309-04

Sim. Tissue Temp: 20.8 (C)

Antenna: Fixed	TX Freq: 2437.5 MHz
Battery: IBM Laptop's battery	Start power: 0.083 W
Carry acc.: None	Audio/Data acc.: None

Comments: Shorten scan

**Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.**

**Representative "normal" scan run time was 29 minutes**

**"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 0.36mW/g; 10-g Avg. = 0.20mW/g**

**"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 0.43mW/g; 10-g Avg. = 0.24mW/g**

**(see part 1 of 4 section 9.0 run # CM-Ab-060309-03)**

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),

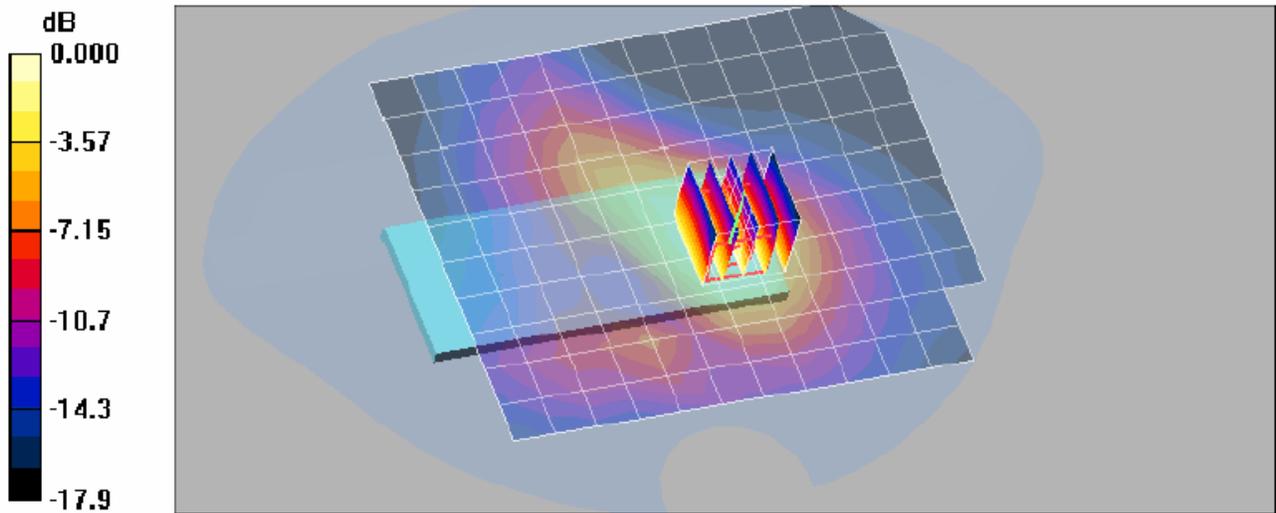
Duty Cycle: 1:1, Medium: 2437 FCC Body, Medium parameters used:  $f = 2437$  MHz;  $\sigma = 2.01$  mho/m;  $\epsilon_r = 51.8$ ;  $\tilde{n} = 1000$  kg/m<sup>3</sup> ; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**Body template/5x5x7 Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.6 V/m; Power Drift = -0.00705 dB

Peak SAR (extrapolated) = 0.703 W/kg

**SAR(1 g) = 0.358 mW/g; SAR(10 g) = 0.204 mW/g**



0 dB = 0.353mW/g

### Highest SAR Configurations Results

Motorola GEMS EME Laboratory

Model #: F2889A, SN: 537SGA0057; Test Date: 3/9/06

Run #: CM-Ab-060309-03

Sim. Tissue Temp: 20.9 (C)

Antenna: Fixed TX Freq: 2437.5 MHz  
Battery: IBM Laptop's battery Start power: 0.079 W  
Carry acc.: None Audio/Data acc.: None

Comments: IBM laptop

Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15),  
Duty Cycle: 1:1, Medium: 2437 FCC Body, Medium parameters used:  $f = 2437$  MHz;  $\sigma = 2.01$  mho/m;  $\hat{a}r = 51.8$ ;  $\hat{n} = 1000$  kg/m<sup>3</sup> ; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**Body template/7x7x7 Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.8 V/m; Power Drift = -0.587 dB

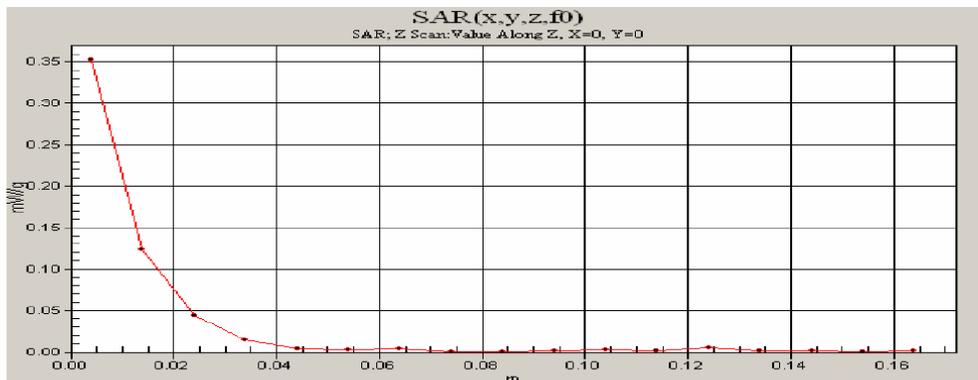
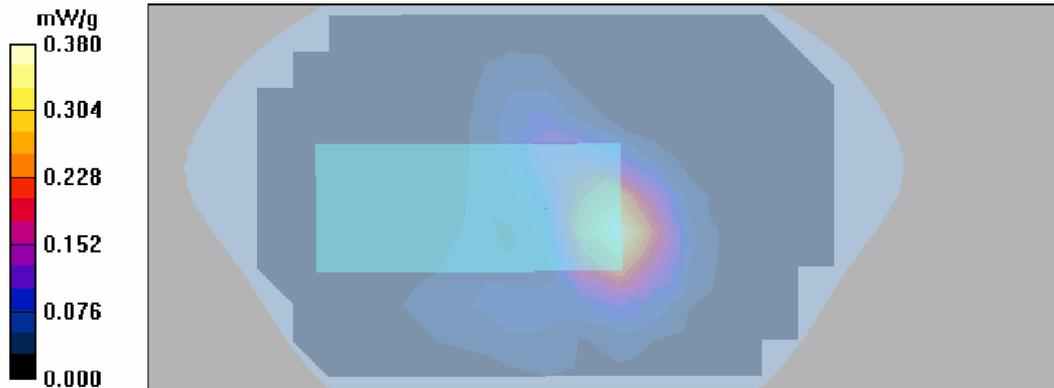
Peak SAR (extrapolated) = 0.745 W/kg

**SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.211 mW/g**

**Body template/Area Scan (101x161x1):** Measurement grid: dx=15mm, dy=15mm

Reference Value = 10.8 V/m; Power Drift = -0.587 dB

**Body template/Z Scan (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm



**Motorola GEMS EME Laboratory**

**Model #: F2889A, SN: 537SGA0060; Test Date: 2/22/06**

Run #: CM-Ab-060222-04

Sim. Tissue Temp: 21.3 (C)

Antenna: Fixed

TX Freq: 4965.0 MHz

Battery: IBM Laptop's battery

Start power: 0.123 W

Carry acc.: None

Audio/Data acc.: None

Comments: IBM Laptop

Probe: EX3DV3 - SN3510, Calibrated: 2/24/2005, ConvF(4.42, 4.42, 4.42)

Duty Cycle: 1:1, Medium: FCC Body 4965 MHz, Medium parameters used:  $f = 4965$  MHz;  $\sigma = 5.15$  mho/m;  $\hat{\alpha}r = 48.1$ ;  $\hat{n} = 1000$  kg/m<sup>3</sup>; Electronics: DAE3 Sn401, Calibrated: 8/18/2005

**HF-Body/Area Scan (201x211x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.323 mW/g

**HF-Body/Z-Axis Scan (1x1x17):** Measurement grid: dx=20mm, dy=20mm, dz=10mm

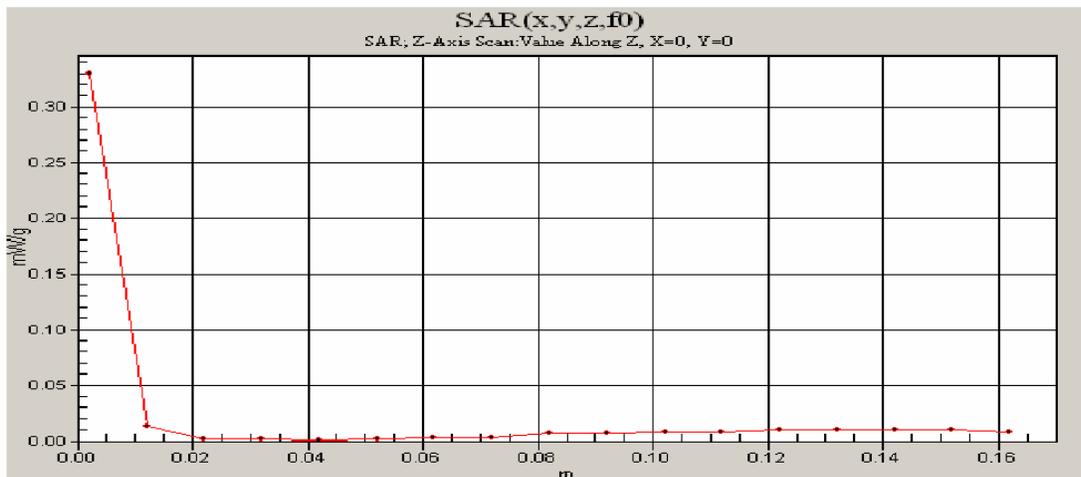
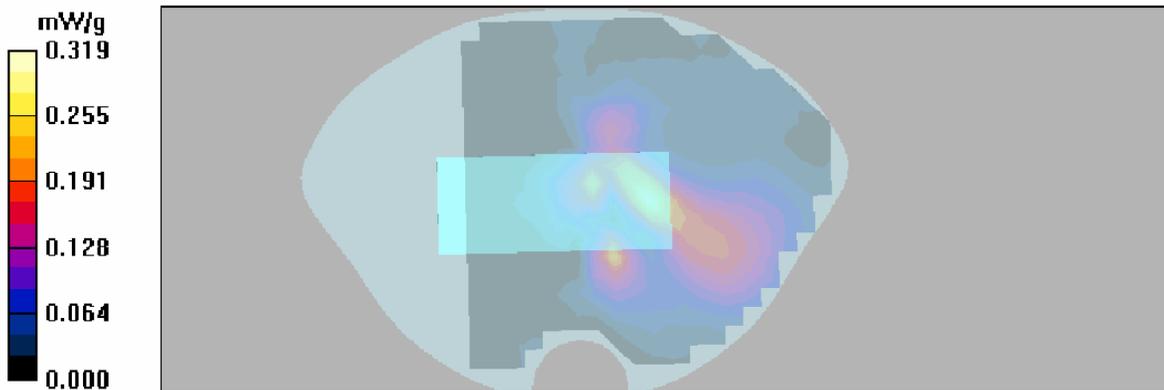
Maximum value of SAR (measured) = 0.330 mW/g

**HF-Body/Zoom Scan (8x8x8)/Cube 0:** Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 8.53 V/m; Power Drift = 0.0975 dB

Peak SAR (extrapolated) = 0.552 W/kg

**SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.0717 mW/g**



**Rough Coarse scan**

**Motorola GEMS EME Laboratory**

**Model #: F2889A, SN: 537SGA0060; Test Date: 2/16/06**

Run #: CM-Ab-060216-04

Sim. Tissue Temp: 20.9 (C)

Antenna: Fixed TX

Freq: 2437.5 MHz

Battery: Dell Laptop's battery

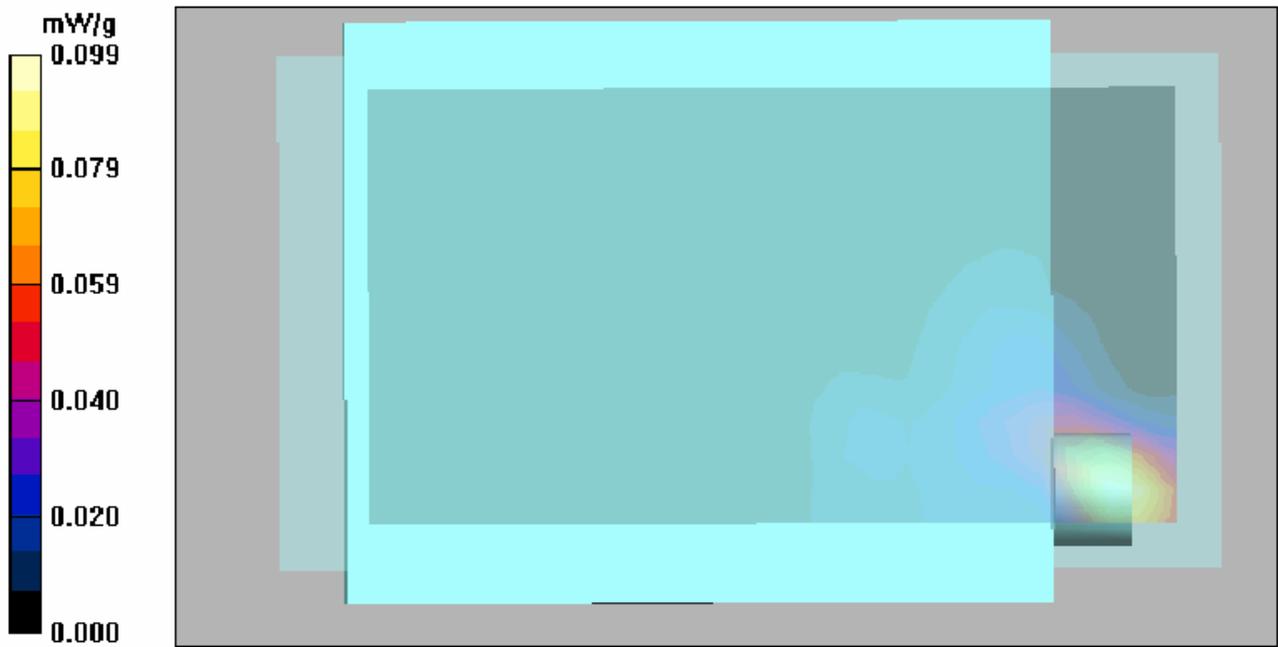
Start power: 0.084 W

Carry acc.: None

Audio/Data acc.: None

Comments: Dell Laptop – Rough Coarse scan using flat phantom 80x60x20 to confirm the peak area  
Probe: ET3DV6 - SN1547, Calibrated: 10/25/2005, ConvF(4.15, 4.15, 4.15), Duty Cycle: 1:1,  
Medium: 2437 FCC Body, Medium parameters used:  $f = 2437$  MHz;  $\sigma = 2$  mho/m;  $\epsilon_r = 54.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;  
Electronics: DAE3 Sn401, Calibrated: 8/18/2005

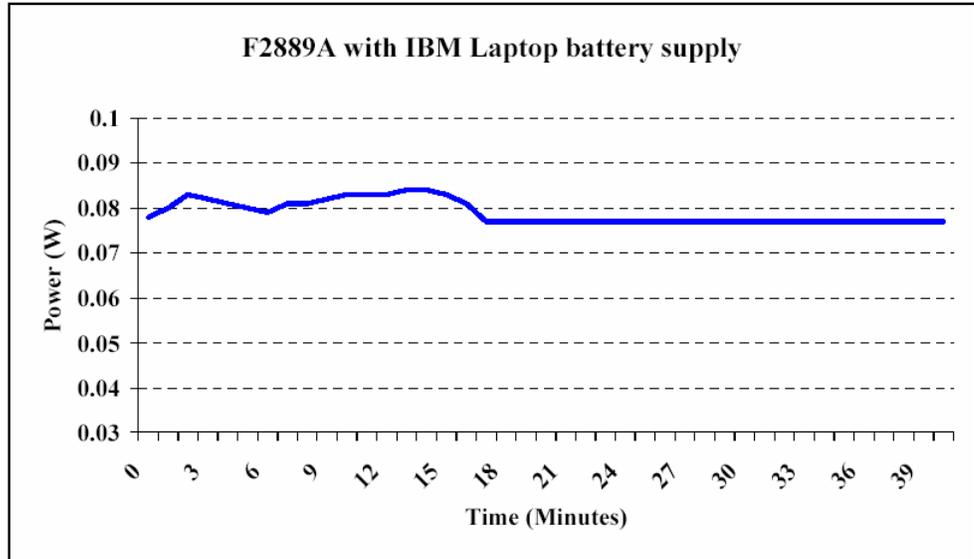
**Body template/Area Scan (181x241x1):** Measurement grid: dx=15mm, dy=15mm



**APPENDIX F**  
**DUT Supplementary Data (Power slump)**

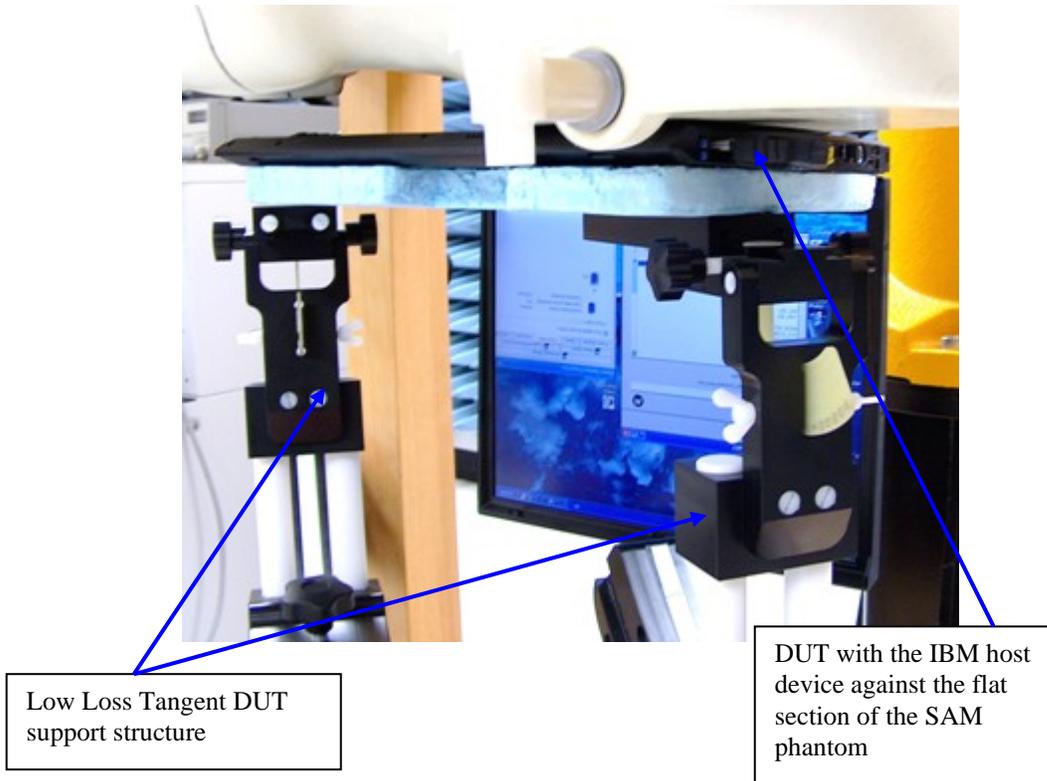
F2889A PCMCIA card in IBM laptop, power slump at 2437.5 MHz.

TIME (Min)	POWER (Watts)
0	0.078
1	0.080
2	0.083
3	0.082
4	0.081
5	0.080
6	0.079
7	0.081
8	0.081
9	0.082
10	0.083
11	0.083
12	0.083
13	0.084
14	0.084
15	0.083
16	0.081
17	0.077
18	0.077
19	0.077
20	0.077
21	0.077
22	0.077
23	0.077
24	0.077
25	0.077
26	0.077
27	0.077
28	0.077
29	0.077
30	0.077
31	0.077
32	0.077
33	0.077
34	0.077
35	0.077
36	0.077
37	0.077
38	0.077
39	0.077
40	0.077



## Appendix G DUT Test Position Photos

**Figure 1: Highest S.A.R. Test Position (Body)  
DUT with IBM laptop host device**



**Figure 2: DUT with DELL laptop host device**

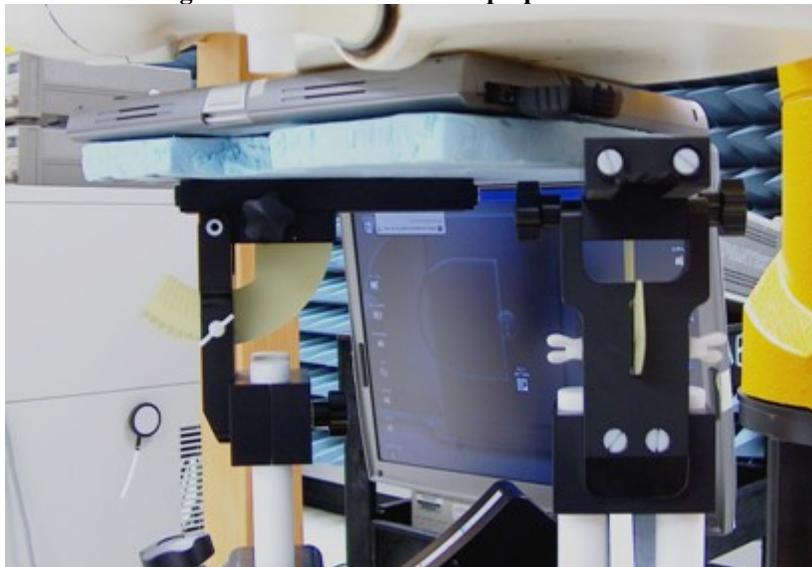


Figure 3: DUT with ML900 laptop host device

