


MOTOROLA


Certificate Number: 2518.01

FCC ID: AZ489FT4826

DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 2 of 3

Networks & Enterprise
EME Test Laboratory
 8000 West Sunrise Blvd
 Fort Lauderdale, FL. 33322

Date of Report: September 15, 2006
Report Revision: O
Report ID: FCC rpt_MTX900_Rev_O_0609015_SR4244

Responsible Engineer: Stephen C. Whalen (SR Staff EME Eng.)
Date/s Tested: 7/28/2006-8/8/2006
Manufacturer/Location: Motorola – Penang
Sector/Group/Div.: N&E/GTDG
Date submitted for test: 7/27/2006
DUT Description: UHF 1 403-470 MHz 4W; Trunking Popular w/o Keypad & Display
Test TX mode(s): CW
Max. Power output: 5.3W
Nominal Power: 4W
Tx Frequency Bands: 403-470 MHz.
Signaling type: FM
Model(s) Tested: PMUE1678B
Model(s) Certified: PMUE1678B
Serial Number(s): 004TGL1003
Classification: Occupational/Controlled
Rule Part(s): 90


Approved Accessories:

Antenna(s):
 PMAE4002A (Stubby 403-433 MHz ¼ wave, -4.5 dBi); PMAE4003A (Stubby 430-470 MHz ¼ wave, -4.5dBi); NAE6483AR (Whip 403-520 MHz ¼ wave, -2 dBi).

Battery(ies):
 HNN9008C (NiMH High Capacity Battery); HNN9009A (NiMH Ultra High Capacity Battery); HNN9010B (NiMH Ultra High Capacity Battery Factory Mutual); HNN9011B (NiCd High Capacity Battery Factory Mutual); HNN9012B (NiCd High Capacity Battery); HNN9013D (Li Ion High Capacity Battery).

Body worn accessory(ies):
 HLN9670A (Leather Case, Thin Battery w/Swivel); HLN9676A (Leather Case, Std. Battery w/Swivel); HLN9714A (Belt Clip); HLN9952A (Belt Clip Carry Holder); HLN9677A (Leather DTMF Case, Thin Battery w/Belt Loop); HLN9689A (Leather DTMF Case, Std. battery w/Belt Loop); HLN9690A (Leather DTMF Case, Thin Battery w/Swivel); HLN9694A (Leather DTMF Case, Std. Battery w/Swivel); HLN9701B (Hard Nylon Case, Belt loop, D-ring, (for all battery sizes)); HLN9652A (Leather Case, Thin Battery w/Belt Loop); HLN9665A (Leather Case, Std. Battery w/Belt Loop).

Audio accessory(ies):
 See section 3.0 for list of approved audio acc.

Max. Calc. : 1-g Avg. SAR: 5.54 W/kg (Body); 10-g Avg. SAR: 4.00 W/kg (Body)
Max. Calc. : 1-g Avg. SAR: 4.06 W/kg (Face); 10-g Avg. SAR: 3.05 W/kg (Face)

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 N&E EME Lab Senior Resource Manager,
Laboratory Director,

Approval Date: 9/15/2006

Certification Date:

Certification No.:

Appendix C

Dipole Calibration Certificates

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **D450V2-1001_May06**

CALIBRATION CERTIFICATE

Object **D450V2 - SN: 1001**

Calibration procedure(s) **QA CAL-15.v4
Calibration Procedure for dipole validation kits below 800 MHz**

Calibration date: **May 25, 2006**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5066 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference Probe ET3DV6	SN 1507	11-Jul-05 (SPEAG, No. ET3-1507_Jul05)	Jul-06
DAE4	SN 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

Calibrated by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	
Approved by:	Name	Function	Signature
	Fin Bornholt	R&D Director	

Issued: May 25, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.6
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom V4.4	Shell thickness: 6 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	43.5	0.87 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	43.6 $\pm$ 6 %	0.86 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	398 mW input power	2.00 mW / g
SAR normalized	normalized to 1W	5.03 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	5.06 mW / g $\pm$ 18.1 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.35 mW / g
SAR normalized	normalized to 1W	3.39 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	3.40 mW / g $\pm$ 17.6 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	51.0 Ω - 9.6 j Ω
Return Loss	- 20.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.343 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 22, 2002

DASY4 Validation Report for Head TSL

Date/Time: 25.05.2006 13:20:31

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN:1001

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450;

Medium parameters used: $f = 450 \text{ MHz}$; $\sigma = 0.86 \text{ mho/m}$; $\epsilon_r = 43.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (LF); ConvF (6.59, 6.59, 6.59); Calibrated: 11.07.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.4; Type: Flat Phantom 4.4
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=398mW/Area Scan (61x201x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.14 mW/g

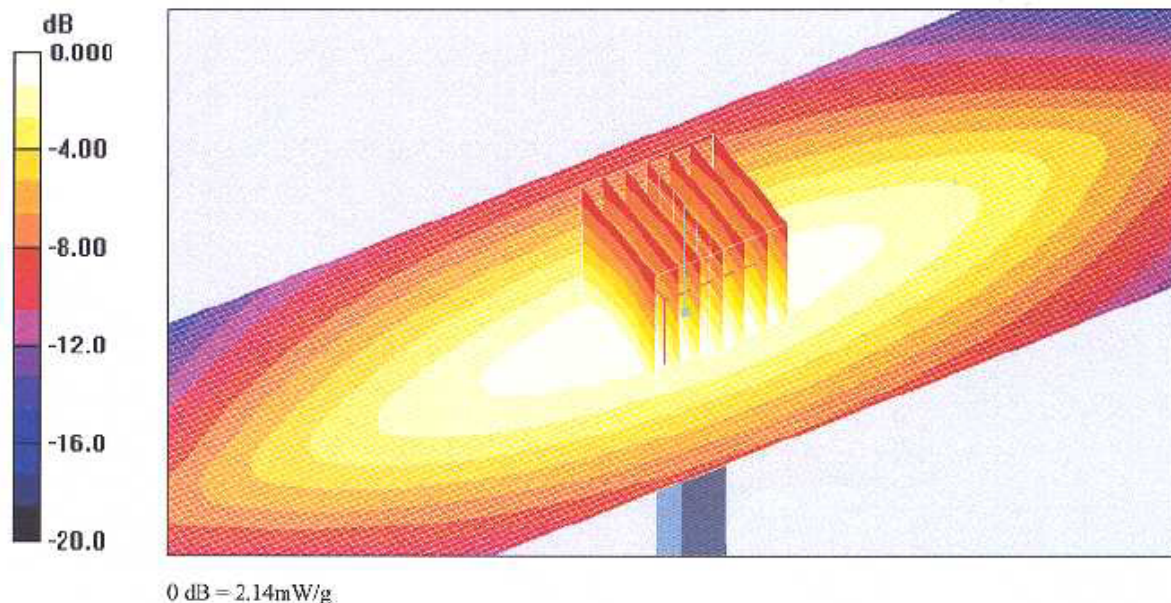
d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.1 V/m; Power Drift = -0.014 dB

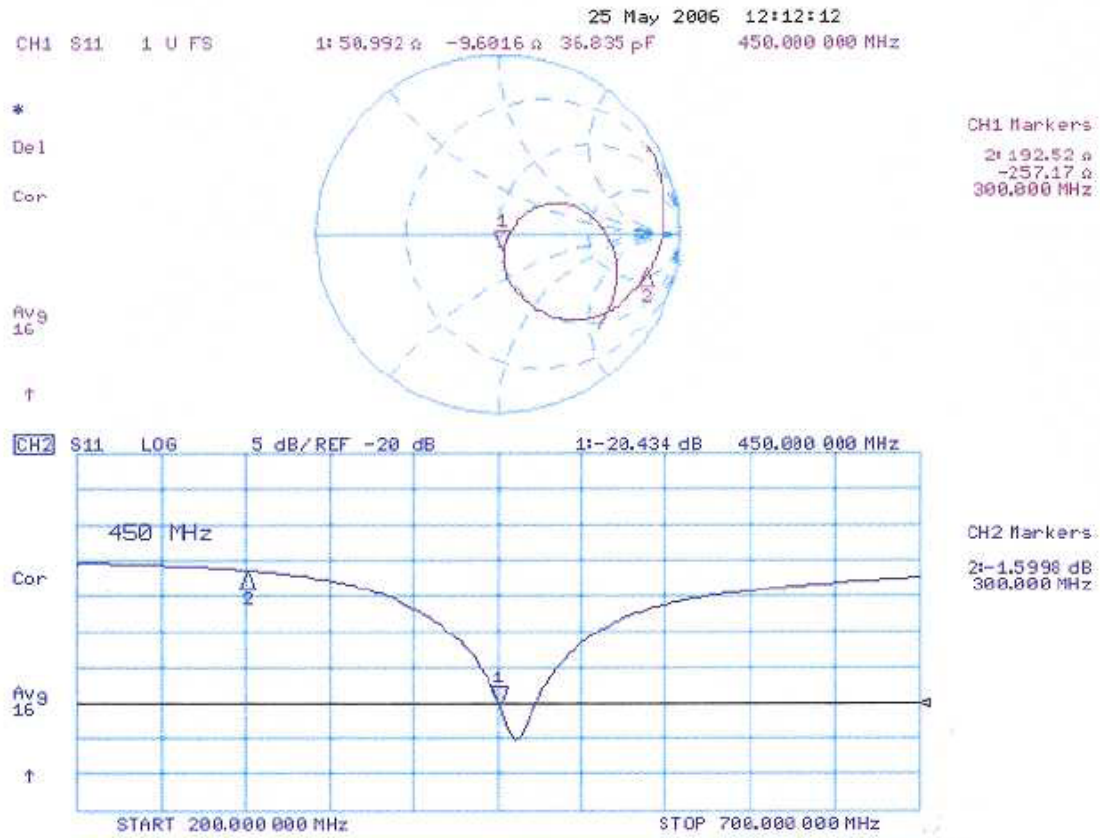
Peak SAR (extrapolated) = 2.85 W/kg

SAR(1 g) = 2 mW/g; SAR(10 g) = 1.35 mW/g

Maximum value of SAR (measured) = 2.14 mW/g



Impedance Measurement Plot for Head TSL



Appendix D

Test System Verification Scans

Dipole validation scans at the head from SPEAG are provided in APPENDIX C. Historically NE's EME lab validated its' dipole(s) 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 system performance validation for dipole S/N 1001 using this methodology 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.

Note: For dipole S/N # 1001 multiple probes were measured using the isotropic assessment procedure mentioned above. The results obtained from each probe were then averaged together to determine the new measured SAR target.

DUT: Dipole 450 MHz; Date/Time: 7/28/2006 9:23:53 AM
 Run #: HvH-SYSP-450B-060728-01 Sim.Tissue Temp: 21.1 (C)
 Robot: GEMS-1 Phantom #: 80302002A-S7
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)
 Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.27 mW/g calculated 1g-SAR; - 3.57 % from target (including drift)
 2.90 mW/g calculated 10g-SAR; - 2.08 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 55.8$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.7 V/m; Power Drift = 0.00826 dB

Peak SAR (extrapolated) = 1.53 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.731 mW/g

Maximum value of SAR (measured) = 1.17 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.7 V/m; Power Drift = 0.00826 dB

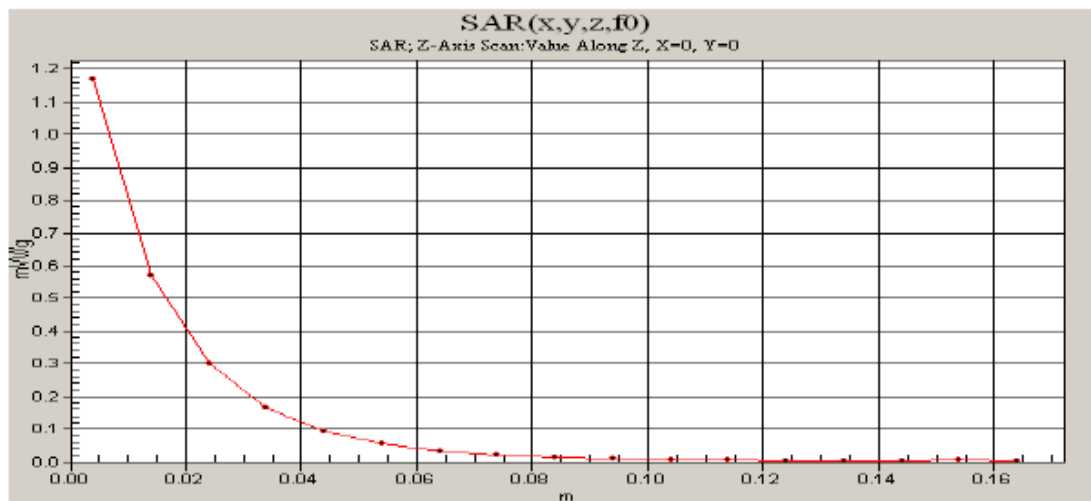
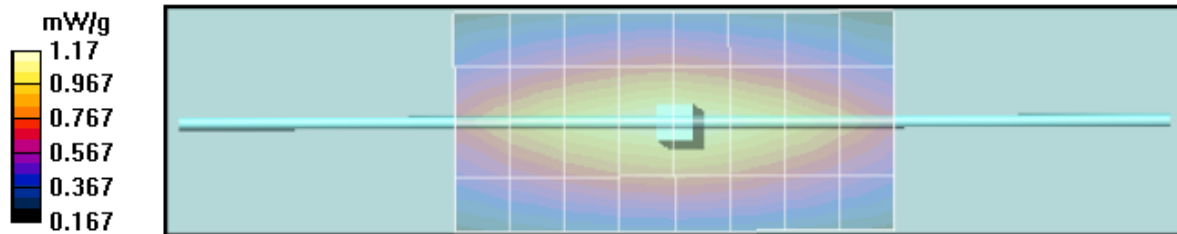
Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.721 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

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

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



DUT: Dipole 450 MHz; Date/Time: 7/29/2006 2:19:33 PM

Run #: CM-SYSP-450B-060729-01 Sim.Tissue Temp: 22.3 (C)

Robot: GEMS-1 Phantom #: 80302002A-S7

Model #: D450V2 S/N: 1001

TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR

4.16 mW/g calculated 1g-SAR; -6.15 % from target (including drift)

2.83 mW/g calculated 10g-SAR; -4.38 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 55.8$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 36.9 V/m; Power Drift = 0.00274 dB

Peak SAR (extrapolated) = 1.50 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.714 mW/g

Maximum value of SAR (measured) = 1.14 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 36.9 V/m; Power Drift = 0.00274 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.702 mW/g

Maximum value of SAR (measured) = 1.11 mW/g

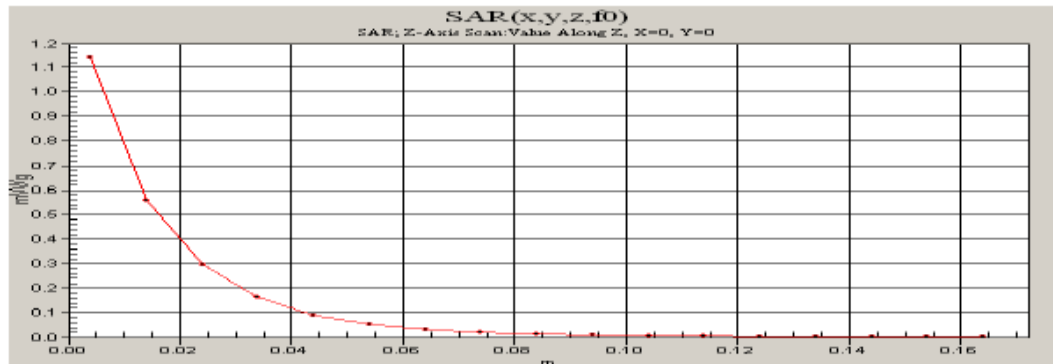
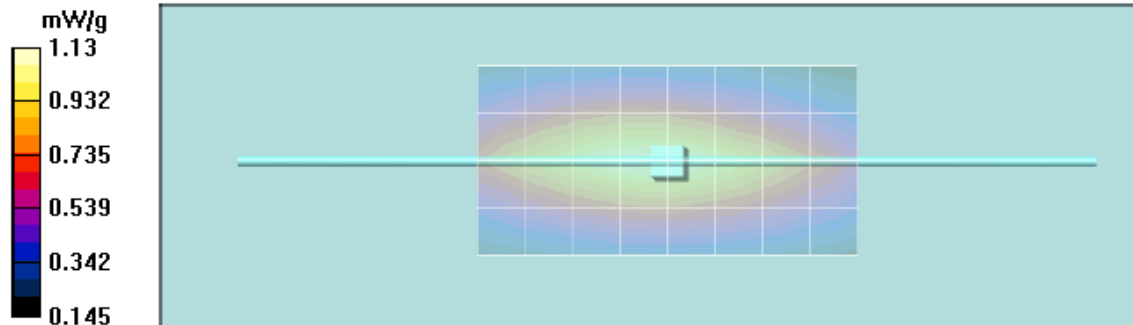
System Performance Check/Dipole Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 36.9 V/m; Power Drift = 0.00274 dB

Motorola Fast SAR: SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.751 mW/g

Maximum value of SAR (interpolated) = 1.13 mW/g

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



DUT: Dipole 450 MHz; Date/Time: 7/30/2006 10:34:04 AM
 Run #: CM-SYSP-450B-060730-01 Sim.Tissue Temp: 22.5 (C)
 Robot: GEMS-1 Phantom #: 80302002A-S7
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)
 Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.29 mW/g calculated 1g-SAR; -3.06 % from target (including drift)
 2.89 mW/g calculated 10g-SAR; -2.24 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 55.5$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.2 V/m; Power Drift = -0.0147 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.721 mW/g

Maximum value of SAR (measured) = 1.15 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.2 V/m; Power Drift = -0.0147 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.709 mW/g

Maximum value of SAR (measured) = 1.12 mW/g

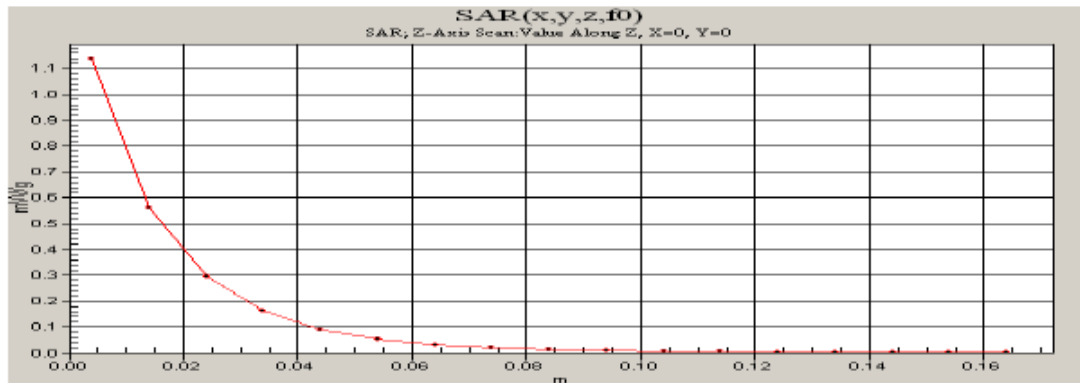
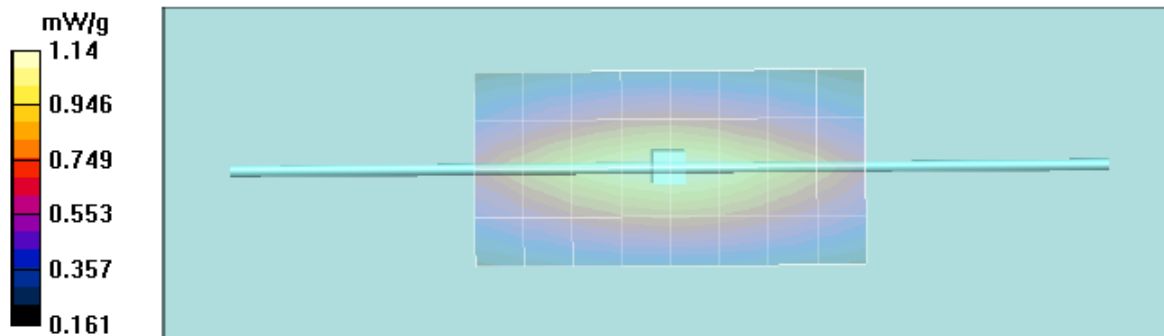
System Performance Check/Dipole Area Scan (41x81x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Reference Value = 37.2 V/m; Power Drift = -0.0147 dB

Motorola Fast SAR: SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.760 mW/g

Maximum value of SAR (interpolated) = 1.14 mW/g

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



DUT: Dipole 450 MHz; Date/Time: 7/31/2006 2:17:01 PM
 Run #: HvH-SYSP-450B-060731-01 Sim.Tissue Temp: 21.7 (C)
 Robot: GEMS-1 Phantom #: 80302002A-S7
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)
 Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.41 mW/g calculated 1g-SAR; - 0.35 % from target (including drift)
 2.99 mW/g calculated 10g-SAR; 1.14 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 56.4$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 37.6 V/m; Power Drift = -0.0143 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.751 mW/g

Maximum value of SAR (measured) = 1.20 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 37.6 V/m; Power Drift = -0.0143 dB

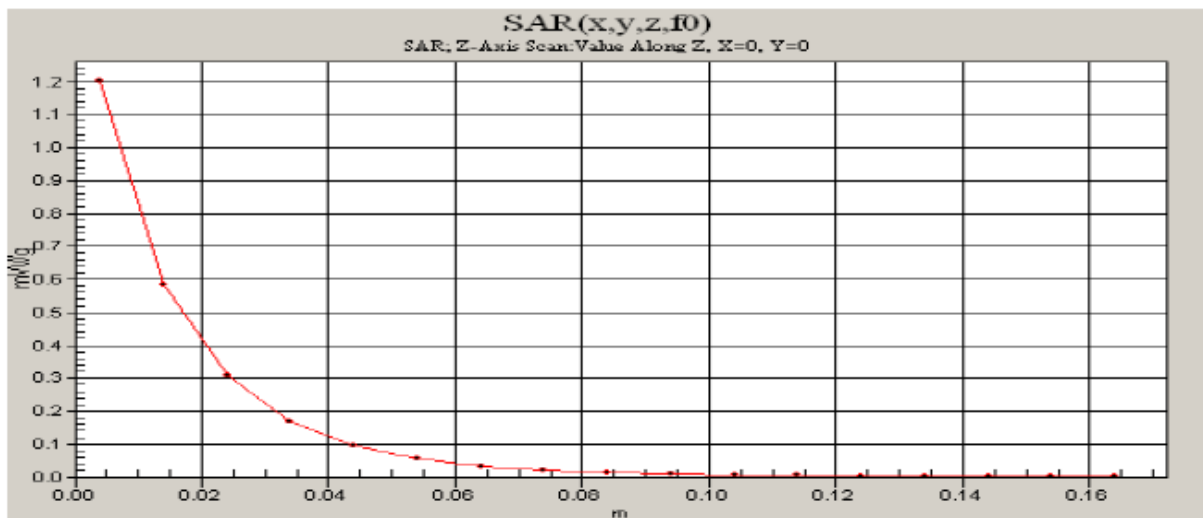
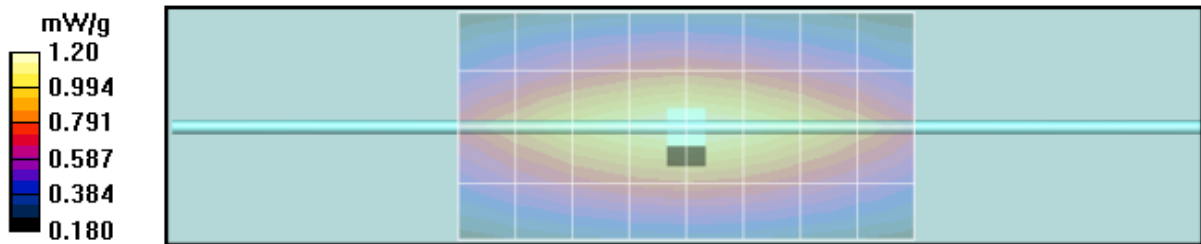
Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.741 mW/g

Maximum value of SAR (measured) = 1.17 mW/g

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

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



DUT: Dipole 450 MHz; Date/Time: 8/1/2006 8:32:51 AM

Run #: HvH-SYSP-450H-060801-01 Sim.Tissue Temp: 22.8 (C)

Robot: GEMS-1 Phantom #: 80302002B-S8

Model #: D450V2 S/N: 1001

TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 5.11 mW/g for 1g SAR 3.34 mW/g for 10g SAR

4.84 mW/g calculated 1g-SAR; - 5.21 % from target (including drift)

3.22 mW/g calculated 10g-SAR; - 3.68 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(6.74, 6.74, 6.74)

Duty Cycle: 1:1, Medium: 450 IEEE Head, Medium parameters used: $f = 450$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.4 V/m; Power Drift = 0.0147 dB

Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.811 mW/g

Maximum value of SAR (measured) = 1.32 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.4 V/m; Power Drift = 0.0147 dB

Peak SAR (extrapolated) = 1.83 W/kg

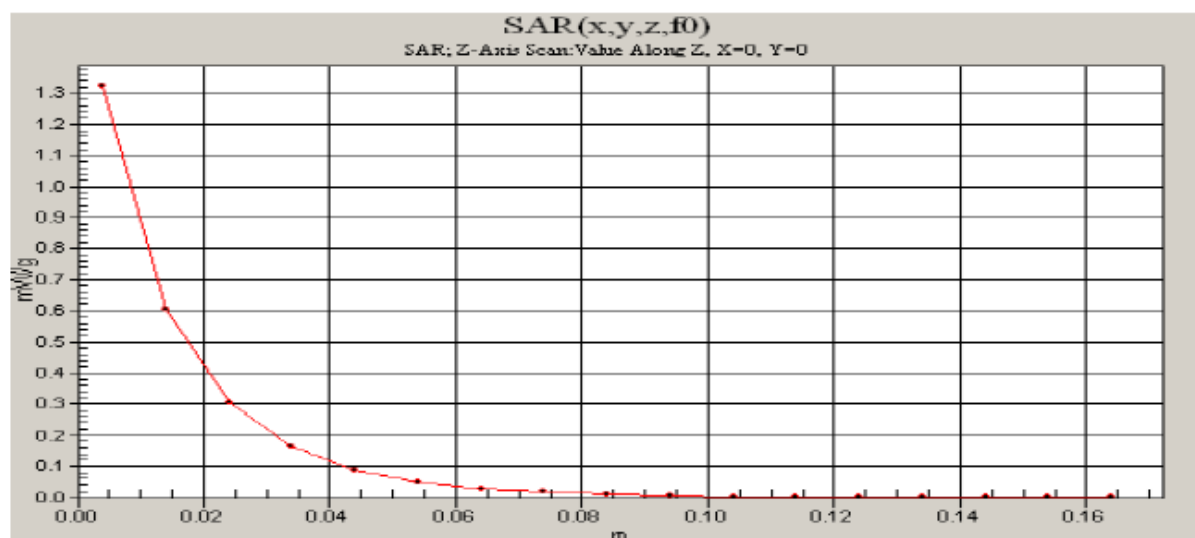
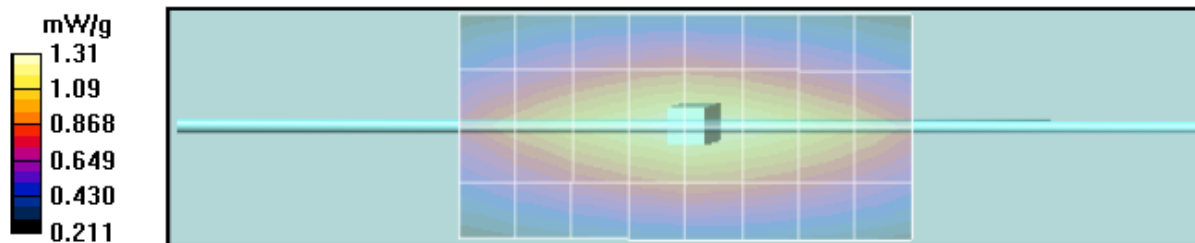
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.803 mW/g

Maximum value of SAR (measured) = 1.30 mW/g

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

Maximum value of SAR (measured) = 1.31 mW/g

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



DUT: Dipole 450 MHz; Date/Time: 8/2/2006 8:27:22 AM

Run #: HvH-SYSP-450H-060802-01 Sim.Tissue Temp: 21.8 (C)

Robot: GEMS-1 Phantom #: 80302002B-S8

Model #: D450V2 S/N: 1001

TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 5.11 mW/g for 1g SAR 3.34 mW/g for 10g SAR

4.82 mW/g calculated 1g-SAR; - 5.77 % from target (including drift)

3.21 mW/g calculated 10g-SAR; - 3.85 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(6.74, 6.74, 6.74)

Duty Cycle: 1:1, Medium: 450 IEEE Head, Medium parameters used: $f = 450$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 43.9$; $\rho = 1000$

kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.4 V/m; Power Drift = 0.0222 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.810 mW/g

Maximum value of SAR (measured) = 1.30 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.4 V/m; Power Drift = 0.0222 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.803 mW/g

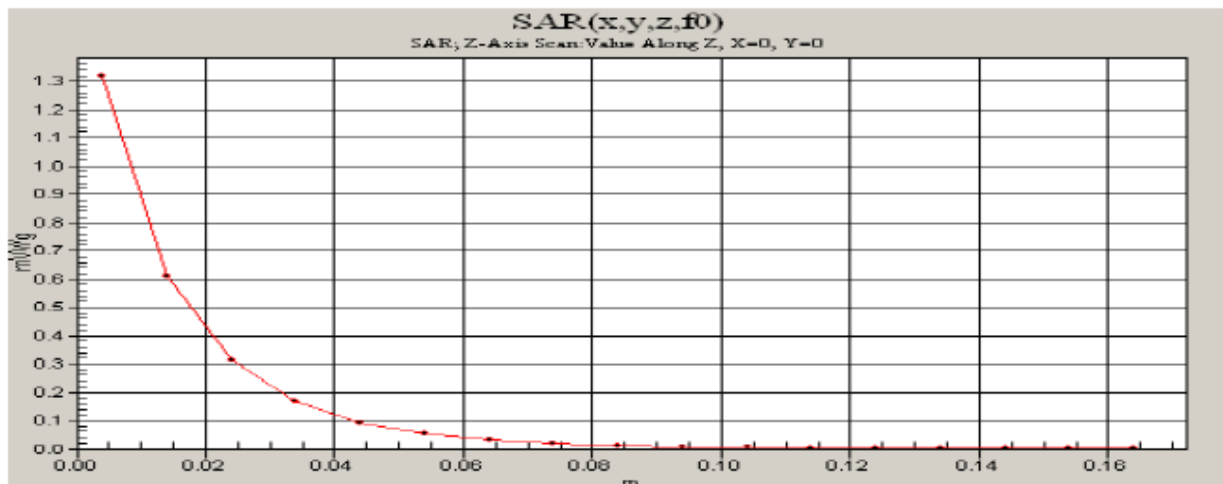
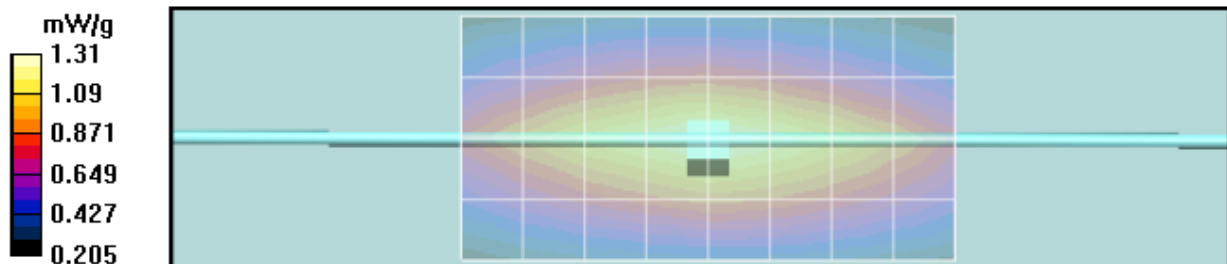
System Performance Check/Dipole Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.31 mW/g

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

dz=10mm

Maximum value of SAR (measured) = 1.32 mW/g



DUT: Dipole 450 MHz; Date/Time: 8/3/2006 2:25:12 PM
 Run #: CM-SYSP-450H-060803-01 Sim.Tissue Temp: 21.7 (C)
 Robot: GEMS-1 Phantom #: 80302002B-S8
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)
 Target: 5.11 mW/g for 1g SAR 3.34 mW/g for 10g SAR
 4.80 mW/g calculated 1g-SAR; -6.00 % from target (including drift)
 3.20 mW/g calculated 10g-SAR; -4.12 % from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(6.74, 6.74, 6.74)

Duty Cycle: 1:1, Medium: 450 IEEE Head, Medium parameters used: $f = 450$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 43.9$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.9 V/m; Power Drift = -0.00326 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.806 mW/g

Maximum value of SAR (measured) = 1.31 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.9 V/m; Power Drift = -0.00326 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.793 mW/g

Maximum value of SAR (measured) = 1.28 mW/g

System Performance Check/Dipole Area Scan (41x81x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

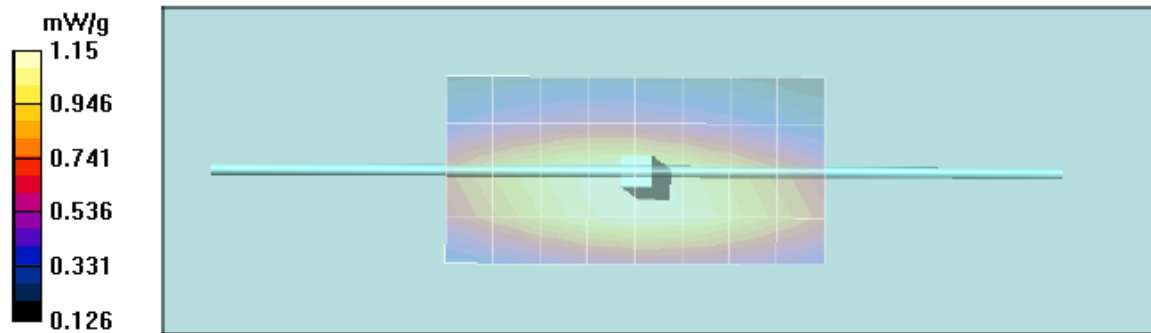
Reference Value = 37.9 V/m; Power Drift = -0.00326 dB

Motorola Fast SAR: SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.851 mW/g

Maximum value of SAR (interpolated) = 1.27 mW/g

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

Maximum value of SAR (measured) = 1.30 mW/g



DUT: Dipole 450 MHz; Date/Time: 8/4/2006 9:25:16 AM

Run #: JsT-SYSP-450B-060804-01 Sim.Tissue Temp: 21.0 (C)
 Robot: GEMS-1 Phantom #: 80302002A-S7
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.46 mW/g calculated 1g-SAR; 0.58% from target (including drift)
 3.01 mW/g calculated 10g-SAR; 1.84% from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.94$ mho/m; $\epsilon_r = 56.4$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.6 V/m; Power Drift = -0.0152 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.753 mW/g

Maximum value of SAR (measured) = 1.20 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

$dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 37.6 V/m; Power Drift = -0.0152 dB

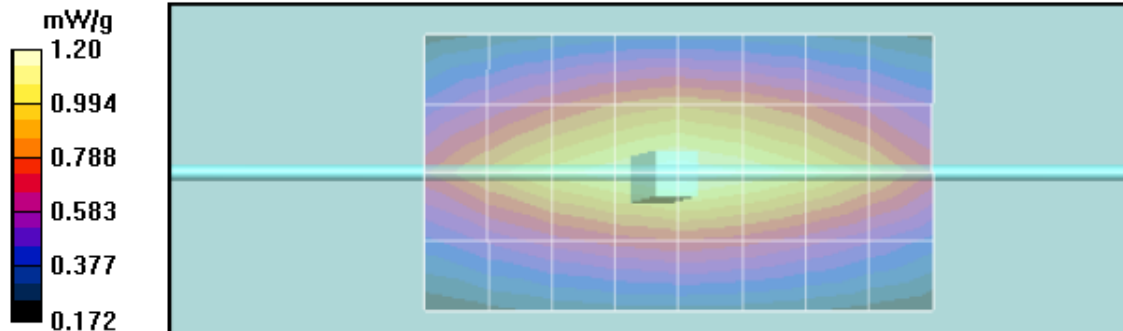
Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.748 mW/g

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

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

Maximum value of SAR (measured) = 1.19 mW/g



DUT: Dipole 450 MHz; Date/Time: 8/7/2006 8:50:35 AM
 Run #: JsT-SYSP-450B-060807-01 Sim.Tissue Temp: 21.2 (C)
 Robot: GEMS-1 Phantom #: 80302002A-S7
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 4.43 mW/g for 1g SAR 2.96 mW/g for 10g SAR
 4.36 mW/g calculated 1g-SAR; -1.62% from target (including drift)
 2.95 mW/g calculated 10g-SAR; -0.40% from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(7.12, 7.12, 7.12)

Duty Cycle: 1:1, Medium: 450 MHz FCC Body, Medium parameters used: $f = 450$ MHz; $\sigma = 0.93$ mho/m; $\epsilon_r = 56.1$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 37.3 V/m; Power Drift = -0.0181 dB

Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.737 mW/g

Maximum value of SAR (measured) = 1.17 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 37.3 V/m; Power Drift = -0.0181 dB

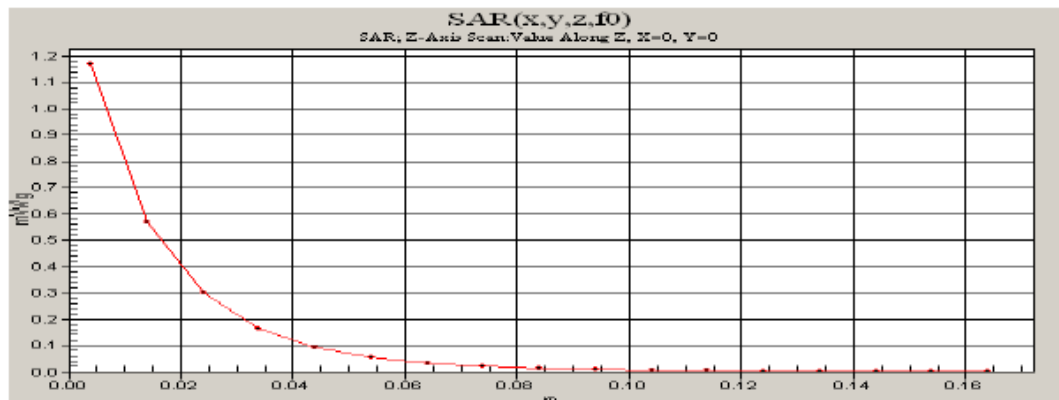
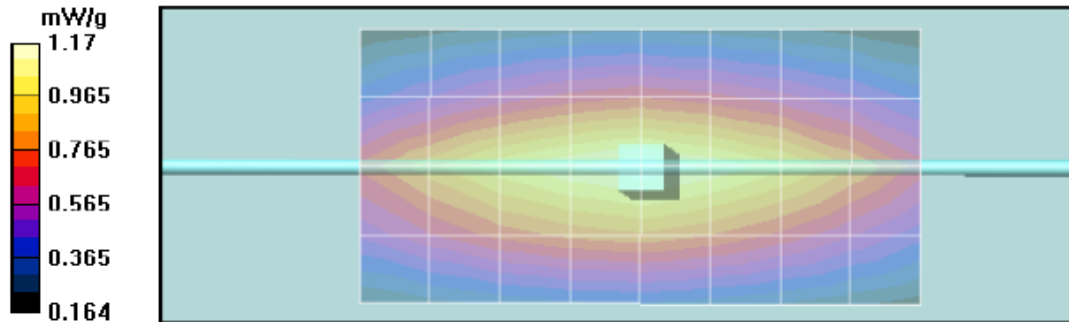
Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.731 mW/g

Maximum value of SAR (measured) = 1.16 mW/g

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

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



DUT: Dipole 450 MHz; Date/Time: 8/8/2006 8:30:53 AM
 Run #: JsT-SYSP-450H-060808-01 Sim.Tissue Temp: 20.7 (C)
 Robot: GEMS-1 Phantom #: 80302002B-S8
 Model #: D450V2 S/N: 1001
 TX Freq: 450 (MHz) Start power: 250 (mW)

Target: 5.11 mW/g for 1g SAR; 3.34 mW/g for 10g SAR
 4.86 mW/g calculated 1g-SAR; -4.80% from target (including drift)
 3.24 mW/g calculated 10g-SAR; -2.94% from target (including drift)

Probe: ET3DV6 - SN1383, Calibrated: 2/22/2006, ConvF(6.74, 6.74, 6.74)

Duty Cycle: 1:1, Medium: 450 IEEE Head, Medium parameters used: $f = 450$ MHz; $\sigma = 0.87$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

Electronics: DAE3 Sn406, Calibrated: 11/21/2005

System Performance Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.3 V/m; Power Drift = 0.0135 dB

Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.817 mW/g

Maximum value of SAR (measured) = 1.32 mW/g

System Performance Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 40.3 V/m; Power Drift = 0.0135 dB

Peak SAR (extrapolated) = 1.82 W/kg

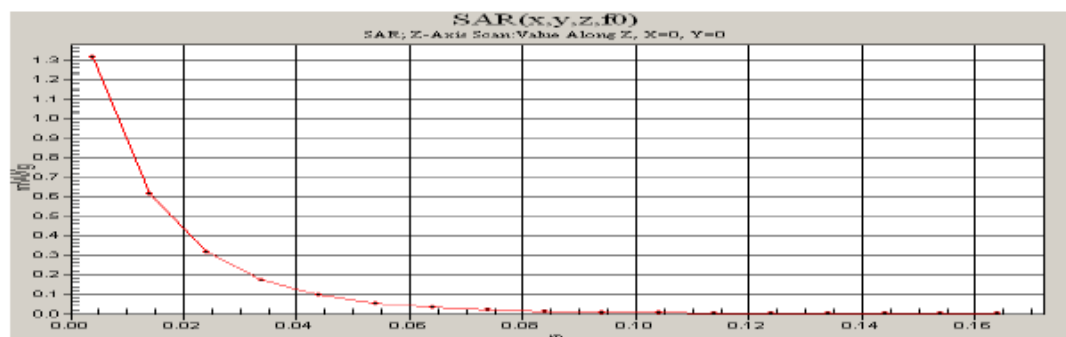
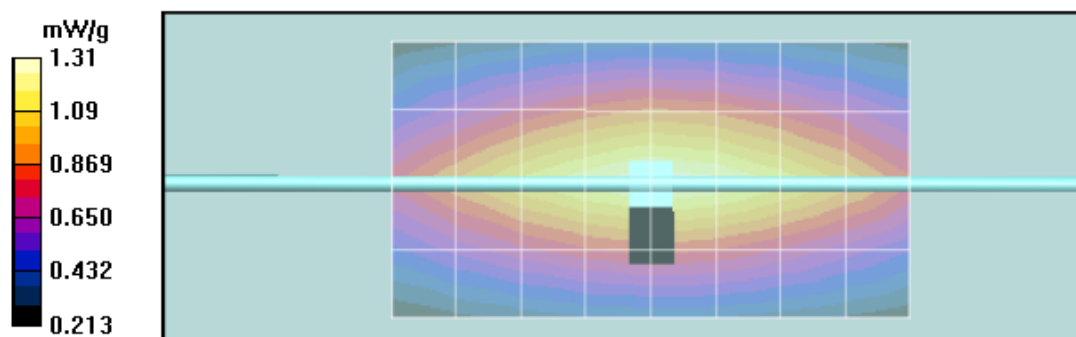
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.808 mW/g

Maximum value of SAR (measured) = 1.30 mW/g

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

Maximum value of SAR (measured) = 1.31 mW/g

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



Certification SAR Target for Dipole System Performance Check

Date:	<u>06/17/06</u>	Frequency (MHz):	<u>450</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>FCC Body</u>
Robot System:	<u>GEMS-3</u>	Ambient Temp.(°C):	<u>22.7</u>
DAE Serial #:	<u>363</u>	Tissue Temp.(°C):	<u>21.4</u>
Tissue Characteristics			
Permittivity:	<u>56.5</u>	Phantom Type/SN:	<u>80602002C-S9</u>
Conductivity:	<u>0.92</u>	Distance (mm):	<u>15</u>
Reference Source:	<u>Dipole</u>	(Dipole)	
Reference SN:	<u>1001</u>		
Power to Dipole:	<u>250</u>	mW	

New Target/Measured

SAR Value: 4.43 mW/g, 2.96 mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Test performed by: Ed Church Initial: EC

The target was derived from the averaged values of multiple probes.

Certification Target for Dipole System Validation

Date:	<u>6/17/2006</u>	Frequency (MHz):	<u>450</u>
Lab Location:	<u>GEMS EME</u>	Mixture Type:	<u>IEEE Head</u>
Robot System:	<u>GEMS-3</u>	Ambient Temp.(°C):	<u>22.6</u>
DAE Serial #:	<u>363</u>	Tissue Temp.(°C):	<u>21.9</u>

Tissue Characteristics

Permittivity:	<u>45.2</u>	Phantom Type/SN:	<u>80302002B-S8</u>
Conductivity:	<u>0.91</u>	Distance (mm):	<u>15</u>

Reference Source:	<u>Dipole</u>	(Dipole)	
Reference SN:	<u>1001</u>		

Power to Dipole:	<u>250</u>	mW	
Power Output (radio):	<u>n/a</u>	mW	

IEEE Target SAR Value: 4.90 mW/g, 3.30 mW/g (10g avg.)
(normalized to 1.0 W)

Measured SAR Value: **5.11** mW/g, **3.34** mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty k=2): **4.29%** (1g ave)
1.21% (10g ave)

Test performed by: **Ed Church** Initial: **E.C**

The target was derived from the averaged values of multiple probes.