



**MOTOROLA**



**CGISS EME Test Laboratory**  
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Fort Lauderdale, FL. 33322

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

**Date of Report:** May 8, 2003  
**Report Revision:** Rev. O  
**Manufacturer:** Motorola  
**Product Description:** UHF/FRS/GMRS 22 channel; w/  
display; 1W  
**FCC ID:** **K7GT59XX**  
**Tested Model(s):** HCUE1102A  
**Certified Model(s):** HCUE1102A

**Test Period:** 4/4/03 – 4/8/03  
**EME Tech:** Ed Church / Clint Miller  
**EME Eng.:** Deanna Zakharia (Elect. 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

5/8/03

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

\_\_\_\_\_  
Date Approved

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

## **APPENDIX A**

### **Power Slump Data/Shortened Scan**

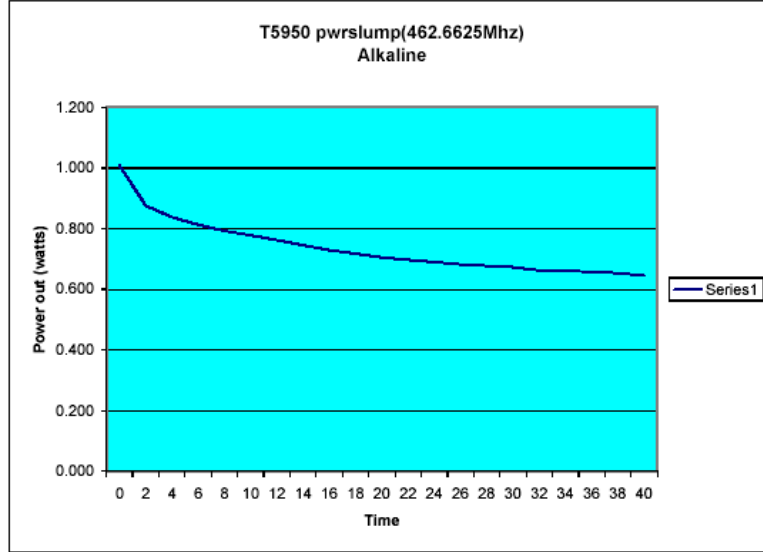
## DUT Power versus time Data

Equipment HP8920B Control # SMHPB030 calibration date Mar 8, 02 Due Mar 8, 04

**Channel 5 Frequency: 462.6625MHz**

**1 Watt**

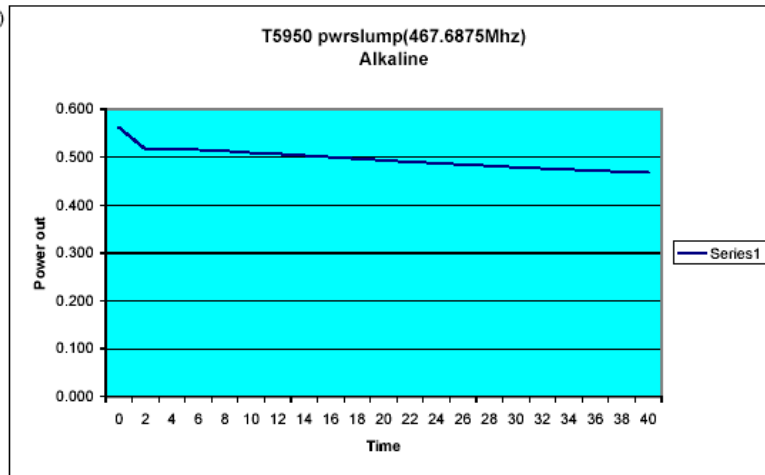
Time (min)	Power Output(W)
0	1.007
2	0.875
4	0.838
6	0.813
8	0.793
10	0.778
12	0.762
14	0.745
16	0.729
18	0.718
20	0.705
22	0.697
24	0.690
26	0.682
28	0.678
30	0.673
32	0.662
34	0.661
36	0.658
38	0.653
40	0.646



**Channel 13 Frequency: 467.6875MHz**

**0.5 Watt**

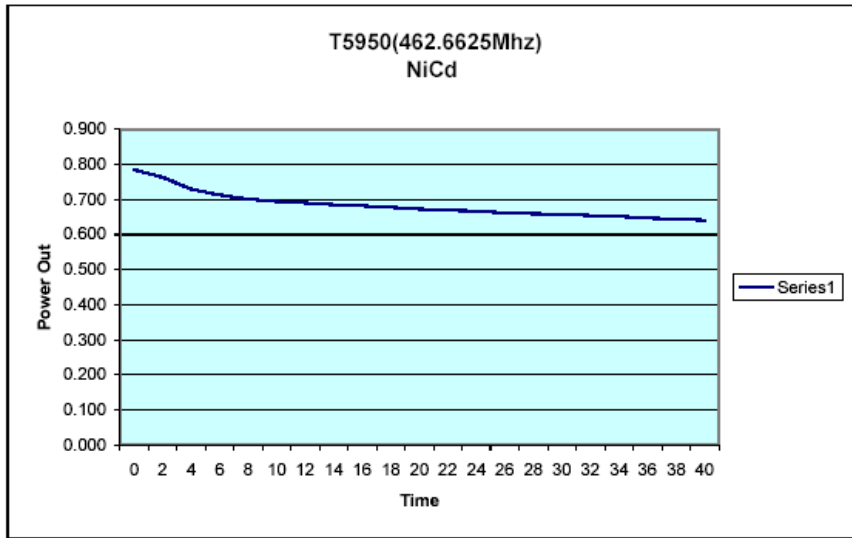
Time (min)	Power Output(W)
0	0.562
2	0.516
4	0.518
6	0.515
8	0.513
10	0.509
12	0.507
14	0.504
16	0.500
18	0.497
20	0.493
22	0.490
24	0.488
26	0.484
28	0.482
30	0.479
32	0.476
34	0.474
36	0.472
38	0.470
40	0.468



**Channel 5 Frequency: 462.6625MHz**

**1 Watt**

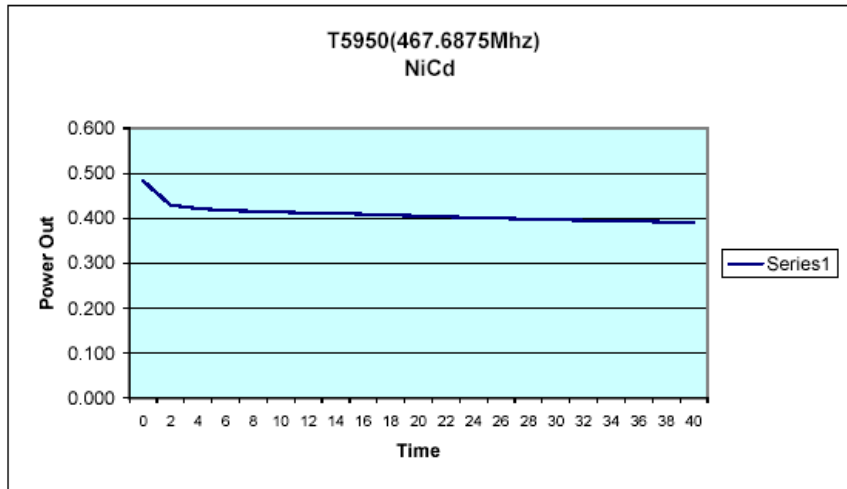
Time (min)	Pwr Out(W)
0	0.785
2	0.764
4	0.729
6	0.713
8	0.701
10	0.695
12	0.690
14	0.685
16	0.682
18	0.678
20	0.673
22	0.670
24	0.667
26	0.662
28	0.659
30	0.658
32	0.655
34	0.652
36	0.647
38	0.644
40	0.641



**Channel 13 Frequency: 467.6875MHz**

**0.5Watt**

Time (min)	Pwr Out (W)
0	0.483
2	0.430
4	0.422
6	0.418
8	0.416
10	0.414
12	0.412
14	0.411
16	0.409
18	0.407
20	0.406
22	0.404
24	0.402
26	0.400
28	0.398
30	0.397
32	0.395
34	0.394
36	0.394
38	0.392
40	0.391



## Shortened Scan Results

**FCC ID: K7GT59XX; Test Date: 4/08/03**

**Motorola CGISS EME Laboratory**

Run #: Ab-R3-030408-07

Model #: HCUE1102A S/N #: 175WDE004S

TX Freq: 462.5625 MHz

Sim Tissue Temp: 20.9 (Celsius)

Start Power = 953 mW

ANTENNA KIT #: FIXED

BATTERY KIT #: AA ALKALINE

ACCESSORIES: CARRY CASE #: NTN9153A

AUDIO ACCESSORIES: RSM #: NTN8867A

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

**Representative “normal” scan run time was 20 minutes**

**“Shortened” scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.55 mW/g; 10-g Avg. = 1.043mW/g**

**“Normal” scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 1.36 mW/g; 10-g Avg. = 0.92 mW/g**

**(see section 7.1 run # Ab-R3-030404-06)**

**DUT w/ carry case against the phantom**

Flat Phantom; Section; Position: (90°,90°);

Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0; FCC

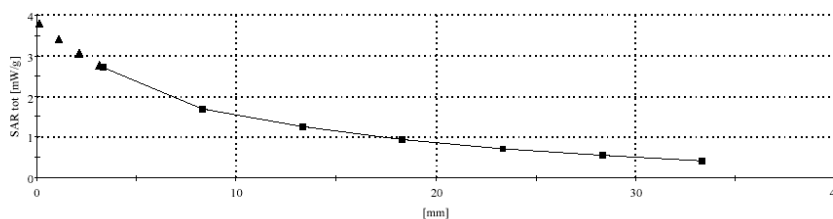
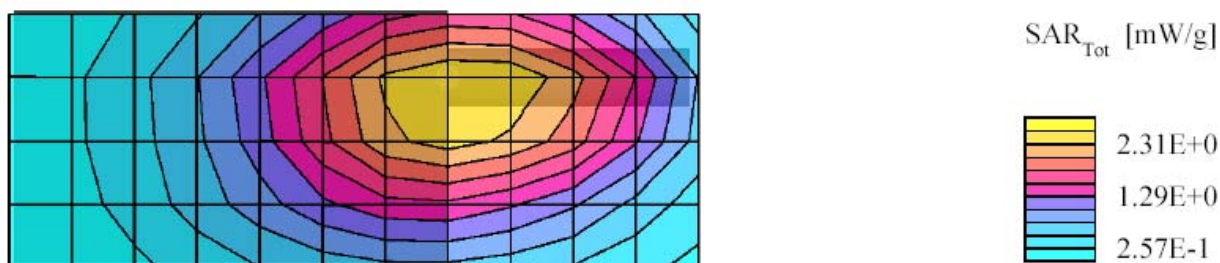
Body 465:  $\sigma = 0.94$  mho/m  $\sigma = 55.1$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3 SN: 374 DAE CAL DATE: 02-19-03

Cube 7x7x7: SAR (1g): 2.50 mW/g, SAR (10g): 1.68 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 19.5, 109.5, 3.2

Power drift: -0.73 dB

Note: The shortened scan represents the highest compliance S.A.R. results



**APPENDIX B**  
**Data Results**

**FCC ID: K7GT59XX; Test Date: 4/4/03**

**Motorola CGISS EME Laboratory**

RUN #: Ab-R3-030404-06

MODEL #: HCUE1102A SER #: 175WDE004S

TX FREQ: 462.5625 MHz

SIM TEMP: 21.0 C

START PWR: .953 W

ANTENNA KIT #: FIXED

BATTERY KIT #: AA ALKALINE

ACCESSORIES: BELT CLIP #: NTN9392B

AUDIO ACCESSORIES: RSM #: NTN8867A

**DUT w/ belt clip against the phantom**

Phantom; Section; Position: (90°,90°);

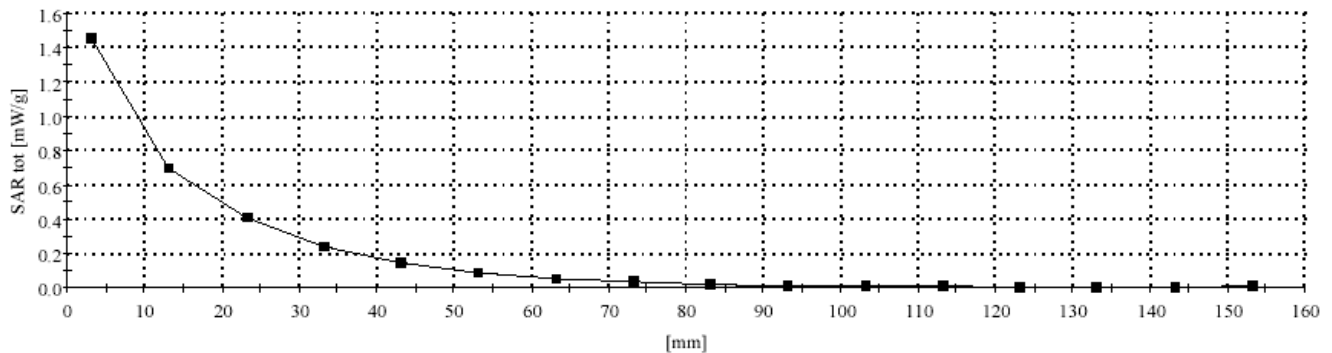
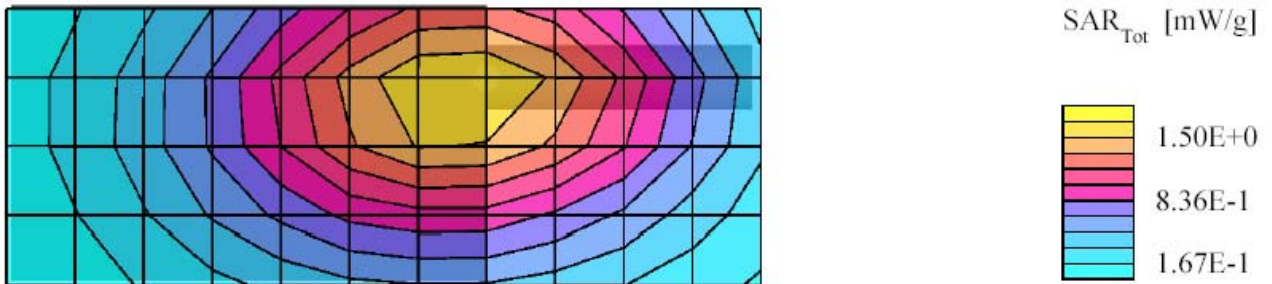
Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0; FCC

Body 465:  $\sigma = 0.95$  mho/m  $\epsilon = 55.1$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3 SN: 374 DAE CAL DATE: 02-19-03

Cube 7x7x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.945 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 18.0, 97.5, 3.2

Power drift: -1.34 dB



FCC ID: K7GT59XX; Test Date: 4/7/03

**Motorola CGISS EME Laboratory**

RUN #: Ab-R3-030407-08

MODEL #: HCUE1102A SER #: 175WDE004S

TX FREQ: 462.5625 MHz

SIM TEMP: 21.1 C

START PWR: .953 W

ANTENNA KIT #: FIXED

BATTERY KIT #: AA ALKALINE

ACCESSORIES: CARRY CASE #: NTN9153A

AUDIO ACCESSORIES: HEADSET /W MIC #: NTN9159B

**DUT w/ carry case against the phantom**

Phantom; Section; Position: (90°,90°);

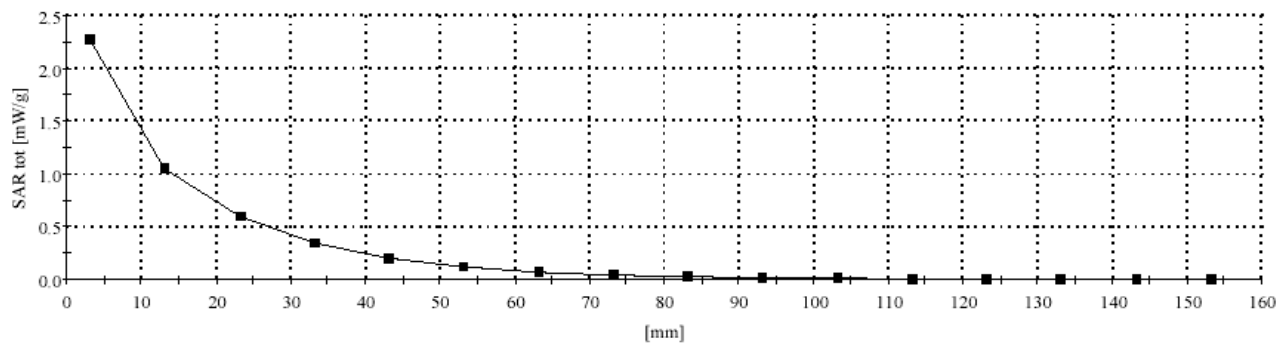
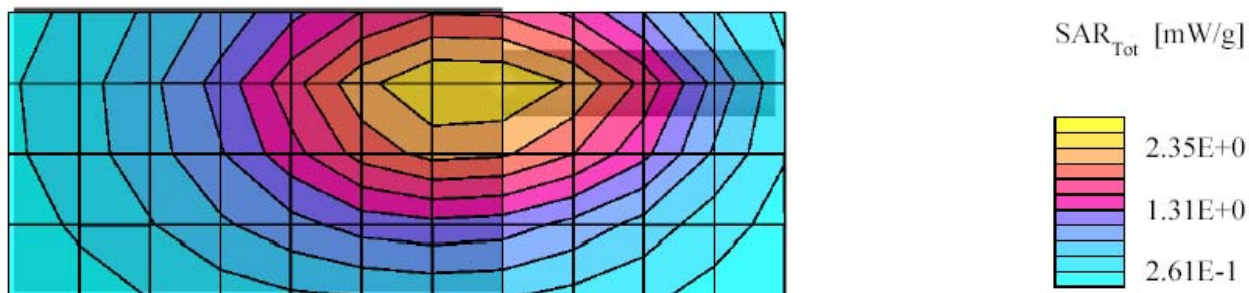
Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0; FCC

Body 465:  $\sigma = 0.93$  mho/m  $\epsilon = 54.8$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3 SN: 374 DAE CAL DATE: 02-19-03

Cube 7x7x7: SAR (1g): 2.11 mW/g, SAR (10g): 1.44 mW/g \* Max outside, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 15.0, 96.0, 3.2

Power drift: -1.00 dB





**FCC ID: K7GT59XX; Test Date: 4/7/03**

**Motorola CGISS EME Laboratory**

RUN #: Ab-R3-030407-11

MODEL #: HCUE1102A SER #: 175WDE004S

TX FREQ: 462.5625 MHz

SIM TEMP: 21.0 C

START PWR: .953 W

ANTENNA KIT #: FIXED

BATTERY KIT #: AA ALKALINE

ACCESSORIES: NONE

AUDIO ACCESSORIES: RSM #: NTN8867A

**DUT w/ front facing phantom and antenna 2.5 cm**

Flat Phantom; Section; Position: (90°,90°);

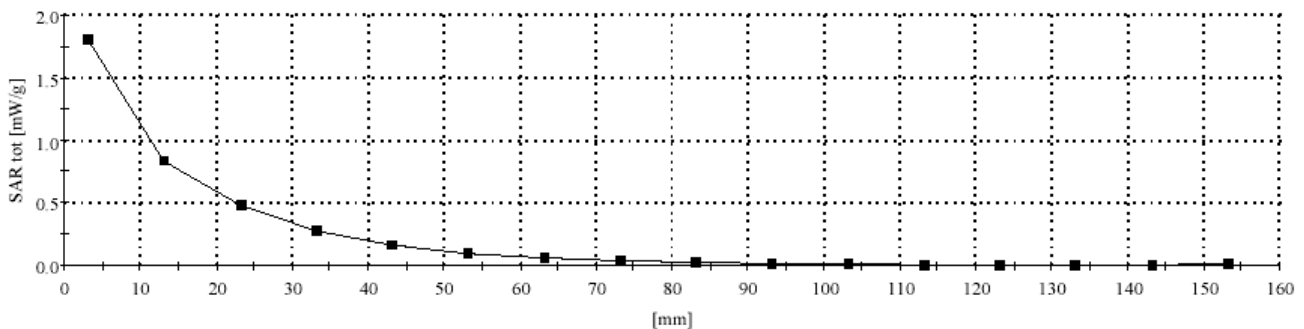
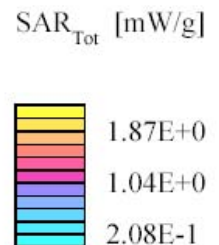
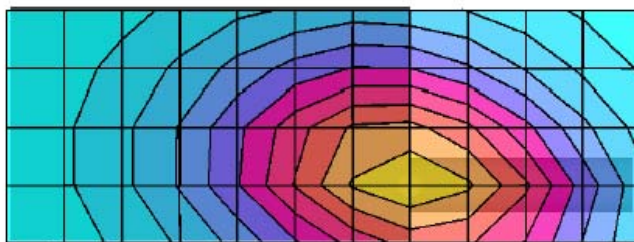
Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0; FCC

Body 465:  $\sigma = 0.93$  mho/m  $\epsilon = 54.8$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3 SN: 374 DAE CAL DATE: 02-19-03

Cube 7x7x7: SAR (1g): 1.66 mW/g, SAR (10g): 1.14 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 45.0, 105.0, 3.2

Power drift: -1.00 dB



**FCC ID: K7GT59XX; Test Date: 4/08/03**

**Motorola CGISS EME Laboratory**

RUN #: Face-R3-030408-09

MODEL #: HCUE1102A SER #: 175WDE004S

TX FREQ: 462.5625 MHz

SIM TEMP: 20.8 C

START PWR: .953 W

ANTENNA KIT #: FIXED

BATTERY KIT #: AA ALKALINE

ACCESSORIES: NONE

AUDIO ACCESSORIES: NONE

**DUT w/ front 2.5 cm from phantom**

Flat Phantom; Section; Position: (90°,90°);

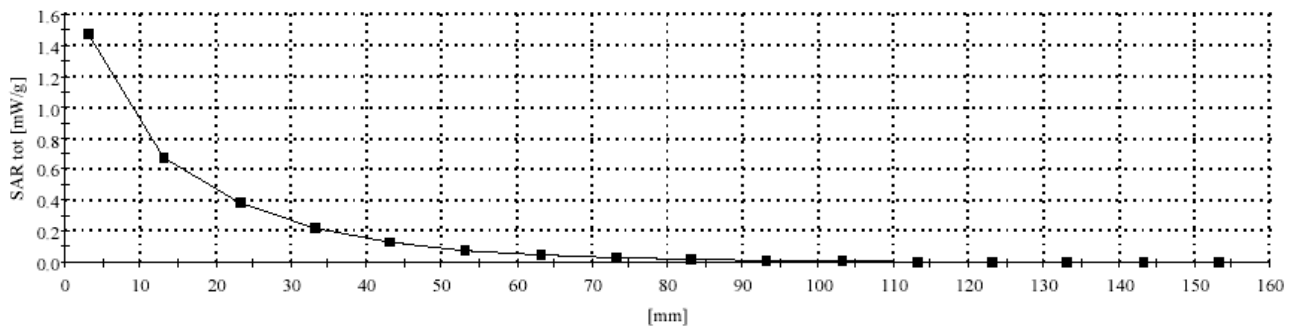
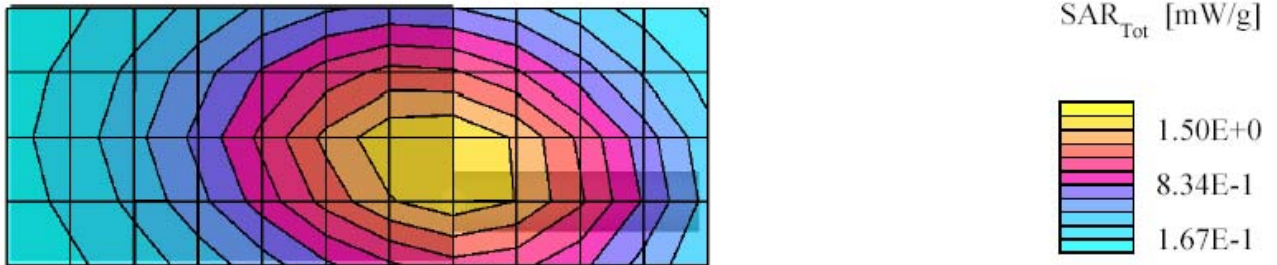
Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0; IEEE

Head 465 MHz:  $\sigma = 0.87$  mho/m  $\epsilon = 43.3$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3 SN: 374 DAE CAL DATE: 02-19-03

Cube 7x7x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.938 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 36.0, 102.0, 3.2

Power drift: -1.08 dB



## **APPENDIX C**

### **Dipole System Performance Check Results**

**SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 4/04/03**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R3-030404-01

TX Freq: 450 MHz

Sim Tissue Temp: 20.7 (Celsius)

Start Power; 250mW

Target at 1W is 4.52 mW/g (1g)

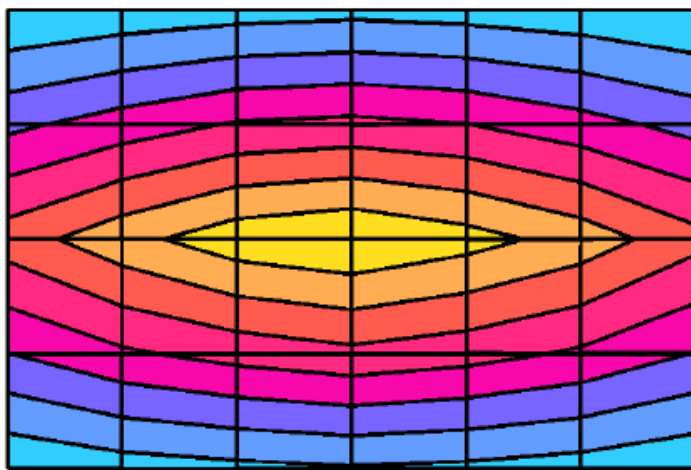
SAR calculated is 4.21 mW/g, Percent from target (including drift) for 1g is - 6.87 %

Flat; Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003);Probe Cal Date: 26/02/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC

Body 450:  $\sigma = 0.93$  mho/m  $\epsilon = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: SN: 374 DAE Cal Date: 02/19/03

Cubes (3): Peak: 1.19 mW/g  $\pm$  19.27 dB, SAR (1g): 0.699 mW/g  $\pm$  0.00 dB, SAR (10g): 0.451 mW/g  $\pm$  0.00 dB, (Worst-case extrapolation) Penetration depth: 12.2 (9.2, 16.3) [mm]

Power drift: -0.01 dB



SAR<sub>Tot</sub> [mW/g]



**SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 4/07/03**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R3-030407-01

TX Freq: 450 MHz

Sim Tissue Temp: 21.1 (Celsius)

Start Power; 250mW

Target at 1W is 4.52 mW/g (1g)

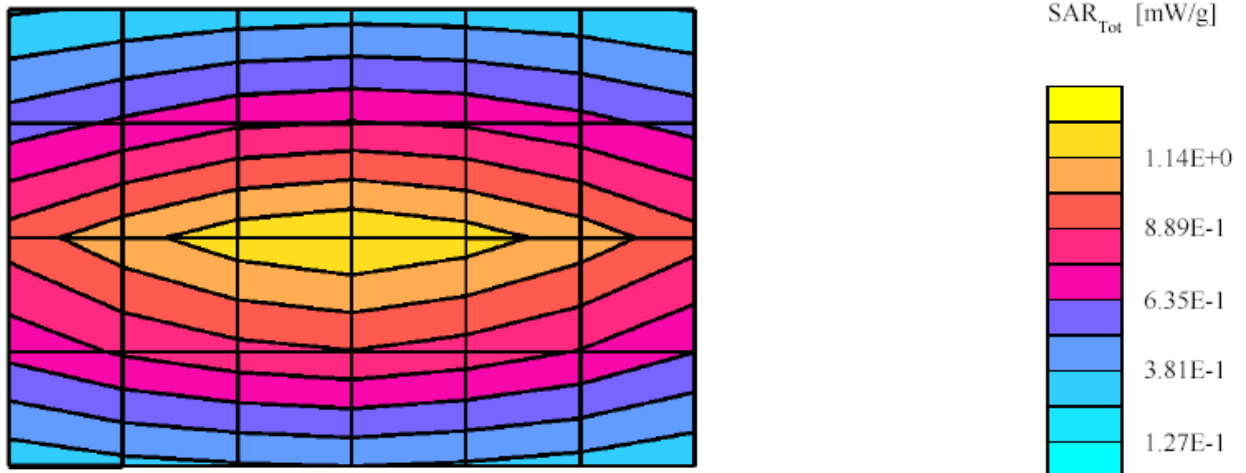
SAR calculated is 4.37 mW/g, Percent from target (including drift) for 1g is - 3.32 %

Flat; Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003);Probe Cal Date: 26/02/03ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC

Body 450:  $\sigma = 0.92$  mho/m  $\epsilon = 55.0$   $\rho = 1.00$  g/cm<sup>3</sup>; DAE3: SN: 374 DAE Cal Date: 02/19/03

Cubes (3): Peak: 1.24 mW/g  $\pm$  17.36 dB, SAR (1g): 0.726 mW/g  $\pm$  0.00 dB, SAR (10g): 0.469 mW/g  $\pm$  0.00 dB, (Worst-case extrapolation) Penetration depth: 12.2 (9.3, 16.3) [mm]

Power drift: -0.01 dB



**SPEAG 450 MHz Dipole; Model D450V2, SN 1002; Test Date: 4/08/03**

**Motorola CGISS EME Lab**

Run #: Sys Perf-R3-030408-08

TX Freq: 450 MHz

Sim Tissue Temp: 20.8 (Celsius)

Start Power; 250mW

Target at 1W is 4.7 mW/g (1g)

SAR calculated is 4.44 mW/g, Percent from target (including drift) for 1g is - 5.53 %

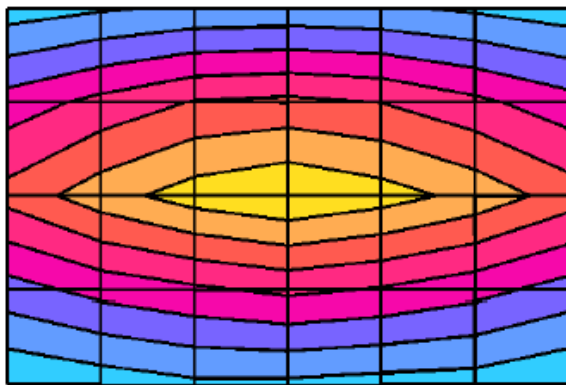
Flat: Probe: ET3DV6 - SN1383 (Cal Date 02-26-2003); ConvF(7.50,7.50,7.50); Probe cal date: 26/02/03; Crest factor: 1.0;

IEEE Head 450 MHz:  $\sigma = 0.86$  mho/m  $\epsilon = 43.7$  A = 1.00 g/cm<sup>3</sup>; DAE3: SN: 374 DAE Cal Date: 02/19/03

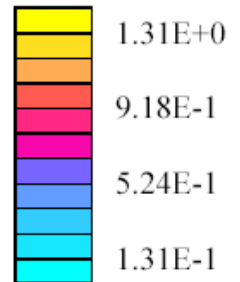
Cubes (3): SAR (1g): 0.739 mW/g  $\pm$  0.00 dB, SAR (10g): 0.477 mW/g  $\pm$  0.00 dB, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 28.5, 45.0, 3.2

Power drift: 0.00 dB



SAR<sub>Tot</sub> [mW/g]



**SYSTEM PERFORMANCE CHECK TARGET SAR**

Date: 1/16/2003 Frequency (MHz): 450  
Lab Location: CGISS Mixture Type: FCC Body  
Robot System: CGISS 3 Ambient Temp.(°C): 22.6, (Humid: 45%)  
Probe Serial #: ET3DV6-1393 Tissue Temp.(°C): 21.5  
DAE Serial #: 406

Tissue Characteristics

Permittivity: 55.4 Phantom Type/SN: 80302002C/S7  
Conductivity: 0.92 Distance (mm): 15 (tissue/dipole cnt)

Reference Source: D450V2 (Dipole)  
Reference SN: 1002

Power to Dipole: 250 mW

Measured SAR Value: 1.13 mW/g, 0.748 mW/g (10g avg.)  
Power Drift: 0 dB

New Target/Measured

SAR Value: 4.52 mW/g, 2.99 mW/g (10g avg.)  
(normalized to 1.0 W, including drift)

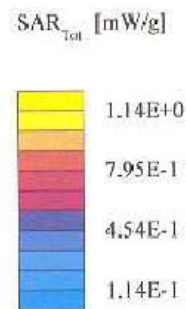
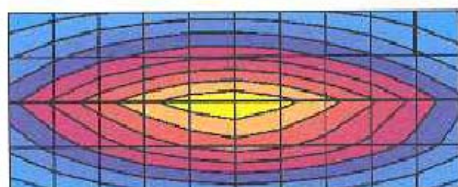
Test performed by: J. Fortier Initial: 

# Dipole D450V2 SN1002; Test date:01/16/03

Run #: Sys Val\_R3\_030116-07      Phantom #:80302002C/S7  
Model #: D450V2      SN: 1002  
Robot: CGISS-3      Tester: J. Fortier  
TX Freq: 450 MHz      Sim Tissue Temp: 21.5 (Celsius)  
Start Power: 250mW  
DAE3: SN:406      DAE Cal Date: 11/11/02

## - Comments-

Target at 1W is 4.52 mW/g (1g), 2.99 mW/g (10g)  
Flat; Probe: ET3DV6 - SNI393 SPEAG; ConvF(8.20,8.20,8.20); Crest factor: 1.0; FCC Body 450:  $\sigma = 0.92$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cubes (2): Peak: 1.74 mW/g  $\pm 0.06$  dB, SAR (1g): 1.13 mW/g  $\pm 0.06$  dB, SAR (10g): 0.748 mW/g  $\pm 0.06$  dB, (Worst-case extrapolation)  
Penetration depth: 13.1 (11.6, 14.9) [mm]  
Powerdrift: -0.00 dB





SYSTEM VALIDATION

Date: 1/16/2003 Frequency (MHz): 450  
Lab Location: CGISS Mixture Type: IEBE Head  
Robot System: CGISS 3 Ambient Temp.(°C): 22.6, (Humid: 46.4%)  
Probe Serial #: ET3DV6-1393 Tissue Temp.(°C): 21.2  
DAE Serial #: 406

Tissue Characteristics

Permittivity: 43.3 Phantom Type/SN: 80302002B/S6  
Conductivity: 0.87 Distance (mm): 15 (tissue/dipole cnt)

Reference Source: D450V2 (Dipole)  
Reference SN: 1002

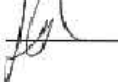
Power to Dipole: 250 mW  
Power Output (radio):          mW

Target SAR Value: 4.9 mW/g, 3.3 mW/g (10g avg.)  
(normalized to 1.0 W)

Measured SAR Value: 1.17 mW/g, 0.774 mW/g (10g avg.)  
Power Drift: -0.02 dB

Measured SAR Value: 4.70 mW/g, 3.11 mW/g (10g avg.)  
(normalized to 1.0 W, including drift)

Percent Difference From Target (MUST be within System Uncertainty): 4.05 % (1g ave)  
5.75 % (10g ave)

Test performed by: J. Fortier Initial: 

**SYSTEM PERFORMANCE CHECK TARGET SAR**

Date: 1/16/2003 Frequency (MHz): 450  
Lab Location: CGISS Mixture Type: IEEE Head  
Robot System: CGISS 3 Ambient Temp.(°C): 22.6, (Humid: 46.4%)  
Probe Serial #: ET3DV6-1393 Tissue Temp.(°C): 21.2  
DAE Serial #: 406

Tissue Characteristics

Permittivity: 43.3 Phantom Type/SN: 80302002B/S6  
Conductivity: 0.87 Distance (mm): 15 (tissue/dipole cnt)


Reference Source: D450V2 (Dipole)  
Reference SN: 1002

Power to Dipole: 250 mW

Measured SAR Value: 1.17 mW/g, 0.774 mW/g (10g avg.)  
Power Drift: -0.02 dB

New Target/Measured

SAR Value: 4.70 mW/g, 3.11 mW/g (10g avg.)  
(normalized to 1.0 W, including drift)

Test performed by: J. Fortier Initial: 

# Dipole D450V2 SN1002; Test date:01/16/03

Run #: Sys Val R3\_030116-04

Phantom #:80302002B/S6

Model #: D450V2

SN: 1002

Robot: CGISS-3

Tester: J. Fortier

TX Freq: 450 MHz

Sim Tissue Temp: 21.2 (Celsius)

Start Power: 250mW

DAE3: SN:406

DAE Cal Date: 11/11/02

- Comments-

Target at 1W is 4.9 mW/g (1g)

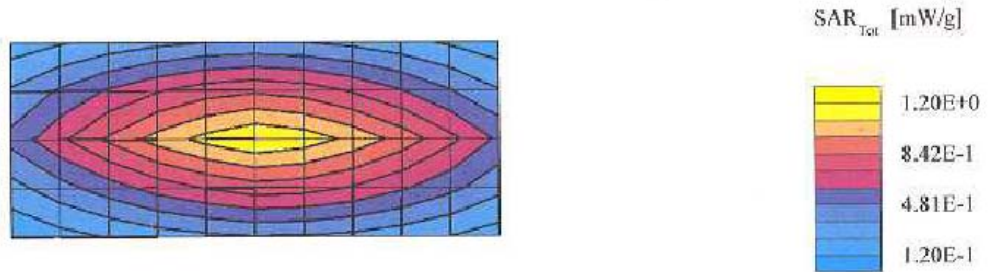
SAR calculated is 4.7 mW/g. Percent from IEEE-1528 target (including drift) for 1g is 4.0%

Flat; Probe: ET3DV6 - SN1393 SPEAG; ConvF(8.00,8.00,8.00); Crest factor: 1.0; IEEE Head 450 MHz:  $\sigma = 0.87$  mho/m  $\epsilon_r = 43.3$   $\rho = 1.00$  g/cm<sup>3</sup>

Cubes (2): Peak: 1.81 mW/g  $\pm$  0.05 dB, SAR (1g): 1.17 mW/g  $\pm$  0.05 dB, SAR (10g): 0.774 mW/g  $\pm$  0.06 dB, (Worst-case extrapolation)

Penetration depth: 12.8 (11.4, 14.5) [mm]



Powerdrift: -0.02 dB



Motorola CGISS EME Lab

**APPENDIX D**  
**Calibration Certificates**

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

# Probe ET3DV6

## SN:1383

Manufactured:	August 16, 1999
Last calibration:	February 21, 2002
Recalibrated:	February 26, 2003

**Calibrated for DASY Systems**

(Note: non-compatible with DASY2 system!)

**DASY - Parameters of Probe: ET3DV6 SN:1383****Sensitivity in Free Space**

NormX	<b>1.80</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	<b>1.55</b> $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	<b>1.62</b> $\mu\text{V}/(\text{V}/\text{m})^2$

**Diode Compression**

DCP X	<b>93</b>	mV
DCP Y	<b>93</b>	mV
DCP Z	<b>93</b>	mV

**Sensitivity in Tissue Simulating Liquid**

Head	<b>900 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	<b>835 MHz</b>	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
ConvF X	<b>6.5</b> $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	<b>6.5</b> $\pm 9.5\%$ (k=2)		Alpha <b>0.59</b>
ConvF Z	<b>6.5</b> $\pm 9.5\%$ (k=2)		Depth <b>1.97</b>
Head	<b>1800 MHz</b>	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	<b>1900 MHz</b>	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
ConvF X	<b>5.2</b> $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	<b>5.2</b> $\pm 9.5\%$ (k=2)		Alpha <b>0.57</b>
ConvF Z	<b>5.2</b> $\pm 9.5\%$ (k=2)		Depth <b>2.54</b>

**Boundary Effect**

Head	<b>900 MHz</b>	<b>Typical SAR gradient: 5 % per mm</b>	
	Probe Tip to Boundary	<b>1 mm</b>	<b>2 mm</b>
	SAR <sub>be</sub> [%] Without Correction Algorithm	10.0	5.2
	SAR <sub>be</sub> [%] With Correction Algorithm	0.1	0.5
Head	<b>1800 MHz</b>	<b>Typical SAR gradient: 10 % per mm</b>	
	Probe Tip to Boundary	<b>1 mm</b>	<b>2 mm</b>
	SAR <sub>be</sub> [%] Without Correction Algorithm	15.1	9.9
	SAR <sub>be</sub> [%] With Correction Algorithm	0.2	0.0

**Sensor Offset**

Probe Tip to Sensor Center	<b>2.7</b>	mm
Optical Surface Detection	<b>0.5 <math>\pm</math> 0.2</b>	mm

# Schmid & Partner Engineering AG

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## Additional Conversion Factors for Dosimetric E-Field Probe

Type:	ET3DV6
Serial Number:	1383
Place of Assessment:	Zurich
Date of Assessment:	February 28, 2003
Probe Calibration Date:	February 26, 2003

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:1383

Conversion factor ( $\pm$  standard deviation)

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

## Dosimetric E-Field Probe ET3DV6 SN:1383

Conversion factor ( $\pm$  standard deviation)

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

# Schmid & Partner Engineering AG

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## Calibration Certificate

### 450 MHz System Validation Dipole

Type:

D450V2

Serial Number:

1002

Place of Calibration:

Zurich

Date of Calibration:

April 5, 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:

*Schmid Katy*

Approved by:

*M. Schmid*

## 1. Measurement Conditions

The measurements were performed in the flat phantom filled with head simulating liquid of the following electrical parameters at 450 MHz:

Relative Dielectricity	<b>44.5</b>	$\pm 5\%$
Conductivity	<b>0.86 mho/m</b>	$\pm 5\%$

The DASY3 System (Software version 3.1d) with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 7.2 at 450 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 and the dipole was oriented parallel to the longer side of the phantom. The standard measuring distance was 15mm from dipole center to the liquid surface including the 6mm thick phantom shell. 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 389 mW  $\pm 3\%$ . 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 <sup>3</sup> (1 g) of tissue:	<b>4.81 mW/g</b> (Advanced Extrapolation)
averaged over 10 cm <sup>3</sup> (10 g) of tissue:	<b>3.19 mW/g</b> (Advanced Extrapolation)

Advanced extrapolation has been applied to the measured SAR values to compensate for the probe boundary effect (see DASY User Manual for details).

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.



### Validation Dipole D450V2 SN:1002, d = 15 mm

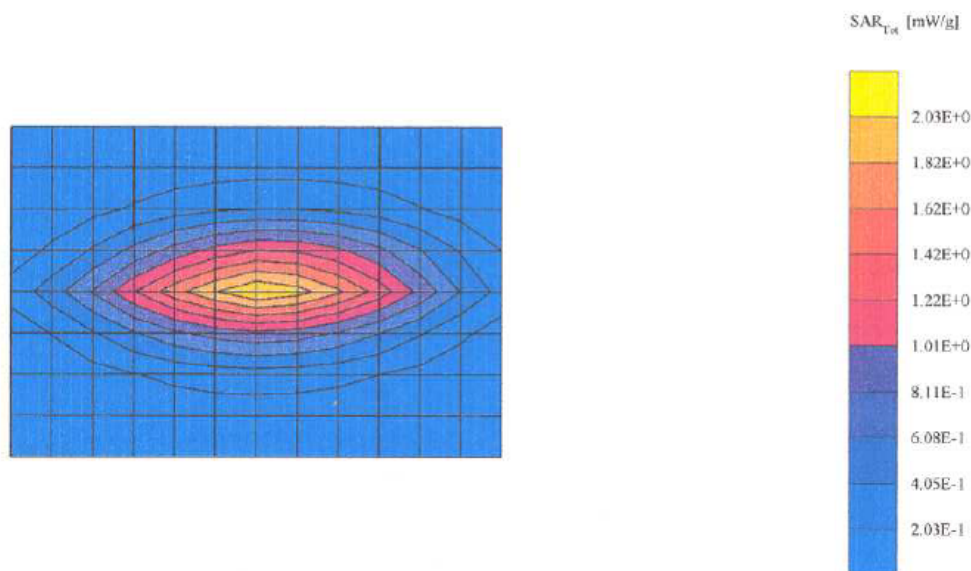
Frequency: 450 MHz; Antenna Input Power: 389 [mW]

Phantom Name: Calibration; Grid Spacing:  $D_x = 20.0$ ,  $D_y = 20.0$ ,  $D_z = 10.0$

Probe: ET3DV6 - SN1507; ConvF(7.20,7.20,7.20); Crest factor: 1.0; Head 450 MHz:  $\sigma = 0.86$  mho/m  $\epsilon_r = 44.5$   $\rho = 1.00$  g/cm<sup>3</sup>

Cubes (2): Peak: 2.84 mW/g  $\pm 0.03$  dB, SAR (1g): 1.87 mW/g  $\pm 0.03$  dB, SAR (10g): 1.24 mW/g  $\pm 0.03$  dB, (Advanced extrapolation)

Penetration depth: 13.0 (11.9, 14.4) [mm]



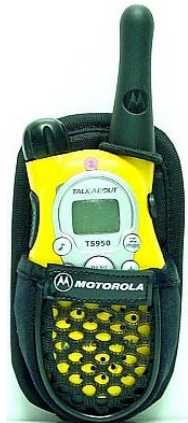
Schmid & Partner Engineering AG, Zurich, Switzerland

**APPENDIX E**  
**Illustration of Body-Worn Accessories**

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: K7GT59XX. 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 NTN9153A  
Back View



**Photo 2.**  
Model NTN9153A  
Front View



**Photo 3.**  
Model NTN9153A  
Side View



**Photo 4.**  
Model 50982  
Front View



**Photo 5.**  
Model NTN9392B  
Back View



**Photo 6.**  
Model NTN9392B  
Side View



**Photo 7.**  
Model NTN9399B  
Front View



**Photo 8.**  
Model NTN9399B  
Side View



**Appendix F**  
**Applicable Accessories and options test status and separation distances**

The following table summarizes the test status and separation distance provided by each of the body-worn accessories:

<b>Carry Case Models</b>	<b>Tested ?</b>	<b>Closest Separation distances between DUT antenna and phantom surface. (mm)</b>	<b>Comments</b>
NTN9392B	Yes	26-32	
NTN9399B	Yes	24-30	
NTN9153A	Yes	19	
50982	Yes	20	
HLN8865A	No	NA	Waterproof bag. DUT not functional while in the bag.

<b>Audio Attachments</b>	<b>Tested ?</b>	<b>Closest Separation distances between DUT antenna and phantom surface. (mm)</b>	<b>Comments</b>
NTN8867A	Yes	NA	NA
NTN8868B	Yes	NA	NA
NTN8870C	Yes	NA	NA
NTN9396B	Yes	NA	NA
NTN9156A	Yes	NA	NA
NTN9159B	Yes	NA	NA
NTN8869B	No	NA	Functional in Receive mode only
NTN8891B	No	NA	Functional in Receive mode only