

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

Client

CALIBRATION CERTIFICATE

Object(s) **DAE3 - SN:558**

Calibration procedure(s) **QA CAL-06 v2
Calibration procedure for the data acquisition unit (DAE)**

Calibration date: **March 07, 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
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bornhoff	R&D Director	

Date issued: March 07, 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.

1. DC Voltage Measurement

DA - Converter Values from DAE

High Range: 1LSB = $6.1\mu\text{V}$, full range = 400 mV
 Low Range: 1LSB = 61nV , full range = 4 mV

Software Set-up: Calibration time: 3 sec Measuring time: 3 sec

Setup	X	Y	Z
High Range	405.010098	404.9037428	405.0817835
Low Range	3.972	3.95185	3.96828
Connector Position	86 °		

High Range	Input	Reading in μV	% Error
Channel X + Input	200mV	200000	0.00
	20mV	20003.4	0.02
Channel X - Input	20mV	-19993	-0.04
Channel Y + Input	200mV	200001	0.00
	20mV	20002.7	0.01
Channel Y - Input	20mV	-19993	-0.04
Channel Z + Input	200mV	200000	0.00
	20mV	20000.8	0.00
Channel Z - Input	20mV	-19997.7	-0.01

Low Range	Input	Reading in μV	% Error
Channel X + Input	2mV	2000.2	0.01
	0.2mV	200.04	0.02
Channel X - Input	0.2mV	-200.81	0.41
Channel Y + Input	2mV	2000.1	0.00
	0.2mV	199.47	-0.27
Channel Y - Input	0.2mV	-201.01	0.50
Channel Z + Input	2mV	1999.9	0.00
	0.2mV	198.68	-0.66
Channel Z - Input	0.2mV	-201.1	0.55

2. Common mode sensitivity

Software Set-up

Calibration time: 3 sec, Measuring time: 3 sec

High/Low Range

in μV	Common mode Input Voltage	High Range Reading	Low Range Reading
Channel X	200mV	-1.0284	-1.5716
	- 200mV	3.9204	1.3725
Channel Y	200mV	6.7686	5.874
	- 200mV	-6.8145	-8.0898
Channel Z	200mV	2.1943	2.766
	- 200mV	-2.52	-4.6218

3. Channel separation

Software Set-up

Calibration time: 3 sec, Measuring time: 3 sec

High Range

in μV	Input Voltage	Channel X	Channel Y	Channel Z
Channel X	200mV	-	0.88082	0.19177
Channel Y	200mV	0.049124	-	0.25676
Channel Z	200mV	-2.1226	-0.89508	-

4. AD-Converter Values with inputs shorted

in LSB	Low Range	High Range
Channel X	16492	16236
Channel Y	16307	15690
Channel Z	16461	16033

5. Input Offset Measurement

Measured after 15 min warm-up time of the Data Acquisition Electronic.
Every Measurement is preceded by a calibration cycle.

Software set-up:

Calibration time: 3 sec
Measuring time: 3 sec
Number of measurements: 100, Low Range

Input 10M Ω

in μ V	Average	min. Offset	max. Offset	Std. Deviation
Channel X	-0.52	-1.64	0.60	0.43
Channel Y	-2.05	-3.65	0.06	0.51
Channel Z	-0.34	-2.05	0.43	0.37

Input shorted

in μ V	Average	min. Offset	max. Offset	Std. Deviation
Channel X	0.04	-0.84	1.09	0.41
Channel Y	-0.77	-2.08	0.17	0.40
Channel Z	-1.01	-1.68	-0.38	0.24

6. Input Offset Current

in fA	Input Offset Current
Channel X	< 25
Channel Y	< 25
Channel Z	< 25

7. Input Resistance

	Calibrating	Measuring
Channel X	200 k Ω	200 M Ω
Channel Y	200 k Ω	200 M Ω
Channel Z	200 k Ω	200 M Ω

8. Low Battery Alarm Voltage

in V	Alarm Level
Supply (+ Vcc)	7.66 V
Supply (- Vcc)	-7.53 V

9. Power Consumption

in mA	Switched off	Stand by	Transmitting
Supply (+ Vcc)	0.000	5.83	14.1
Supply (- Vcc)	-0.011	-7.86	-9.13

10. Functional test

Touch async pulse 1	ok
Touch async pulse 2	ok
Touch status bit 1	ok
Touch status bit 2	ok
Remote power off	ok
Remote analog Power control	ok
Modification Status	B – C

Client C&C (Auden)

CALIBRATION CERTIFICATE

Object(s) ET3DV6 - SN 1762

Calibration procedure(s) QA CAL-01.v2
Calibration procedure for dosimetric E-field probes

Calibration date: March 31, 2003

Condition of the calibrated item In Tolerance (according to the specific calibration document)

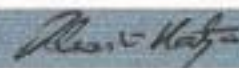
This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

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	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: Nino Valtari Function: Technician Signature: 

Approved by: Katja Pokovic Laboratory Director Signature: 

Date issued: April 2, 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:1762

Manufactured:	January 20, 2003
Last calibration:	March 31, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1762

Sensitivity in Free Space

NormX	1.90 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.78 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.82 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	96	mV
DCP Y	96	mV
DCP Z	96	mV

Sensitivity in Tissue Simulating Liquid

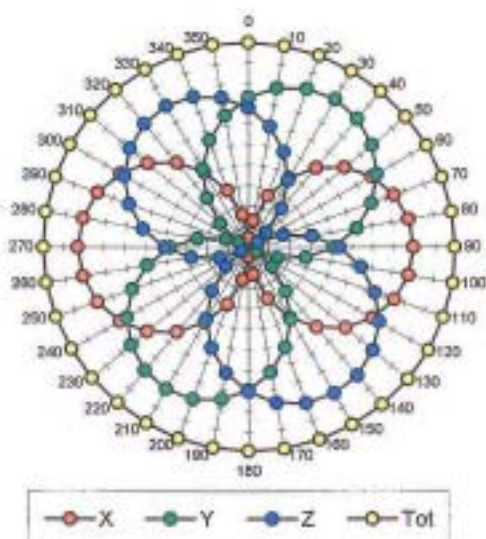
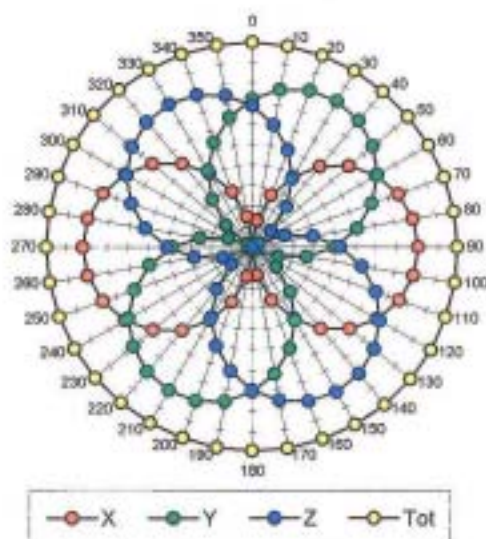
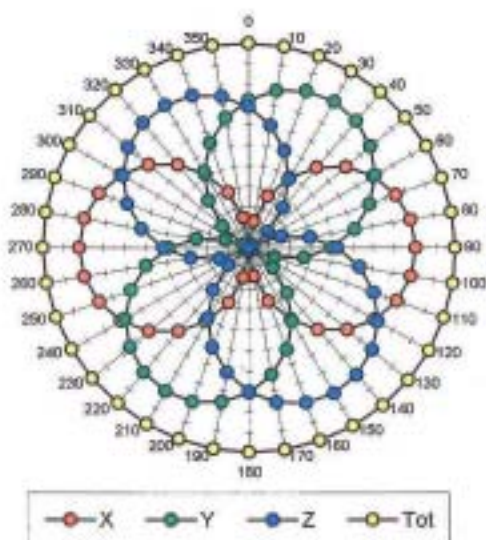
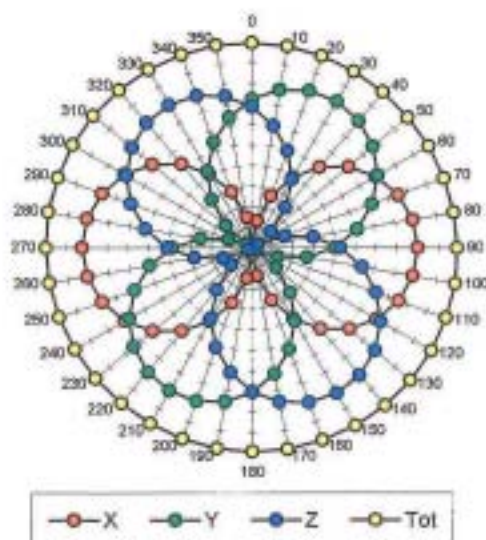
Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
ConvF X	6.7 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.7 $\pm 9.5\%$ (k=2)	Alpha	0.67
ConvF Z	6.7 $\pm 9.5\%$ (k=2)	Depth	1.74
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
ConvF X	5.4 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	5.4 $\pm 9.5\%$ (k=2)	Alpha	0.50
ConvF Z	5.4 $\pm 9.5\%$ (k=2)	Depth	2.63

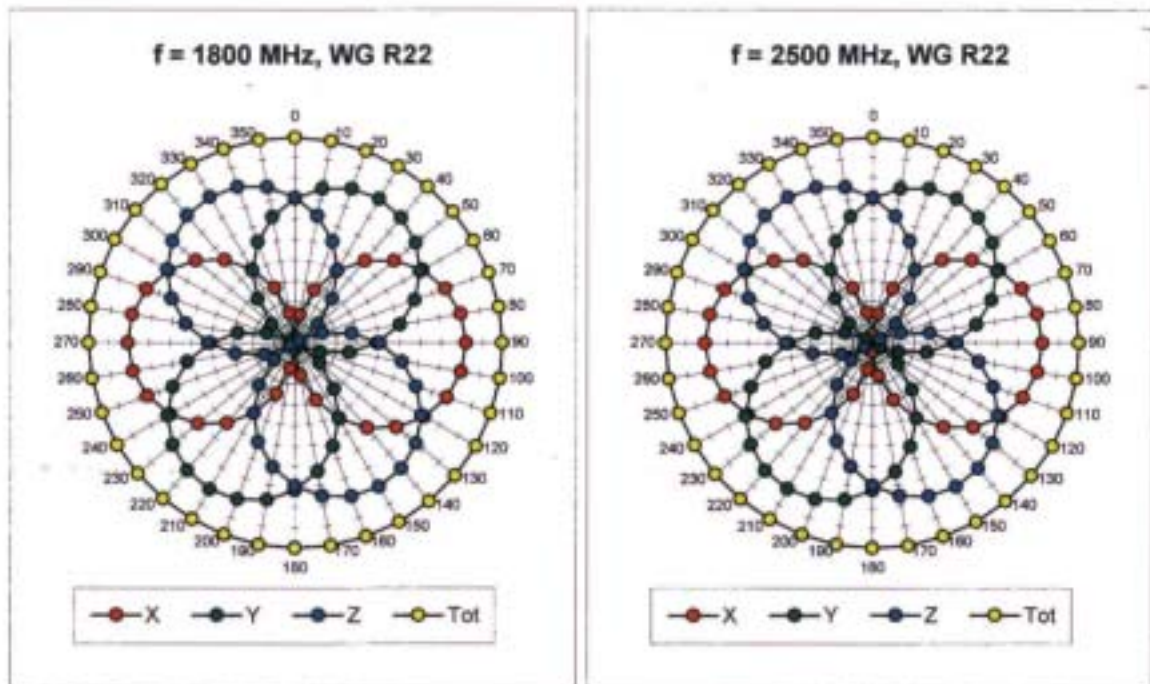
Boundary Effect

Head	900 MHz	Typical SAR gradient: 5 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	8.8	4.5
SAR _{be} [%]	With Correction Algorithm	0.1	0.2
Head	1800 MHz	Typical SAR gradient: 10 % per mm	
Probe Tip to Boundary		1 mm	2 mm
SAR _{be} [%]	Without Correction Algorithm	13.8	9.3
SAR _{be} [%]	With Correction Algorithm	0.2	0.1

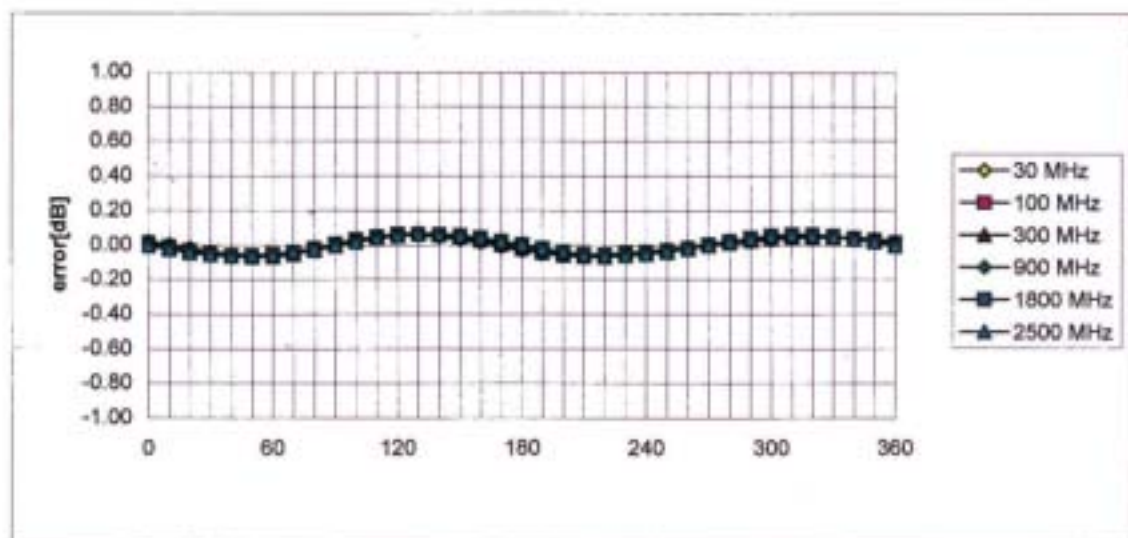
Sensor Offset

Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.4 $\pm$ 0.2	mm

Receiving Pattern (ϕ), $\theta = 0^\circ$ $f = 30 \text{ MHz}$, TEM cell if110 $f = 100 \text{ MHz}$, TEM cell if110 $f = 300 \text{ MHz}$, TEM cell if110 $f = 900 \text{ MHz}$, TEM cell if110

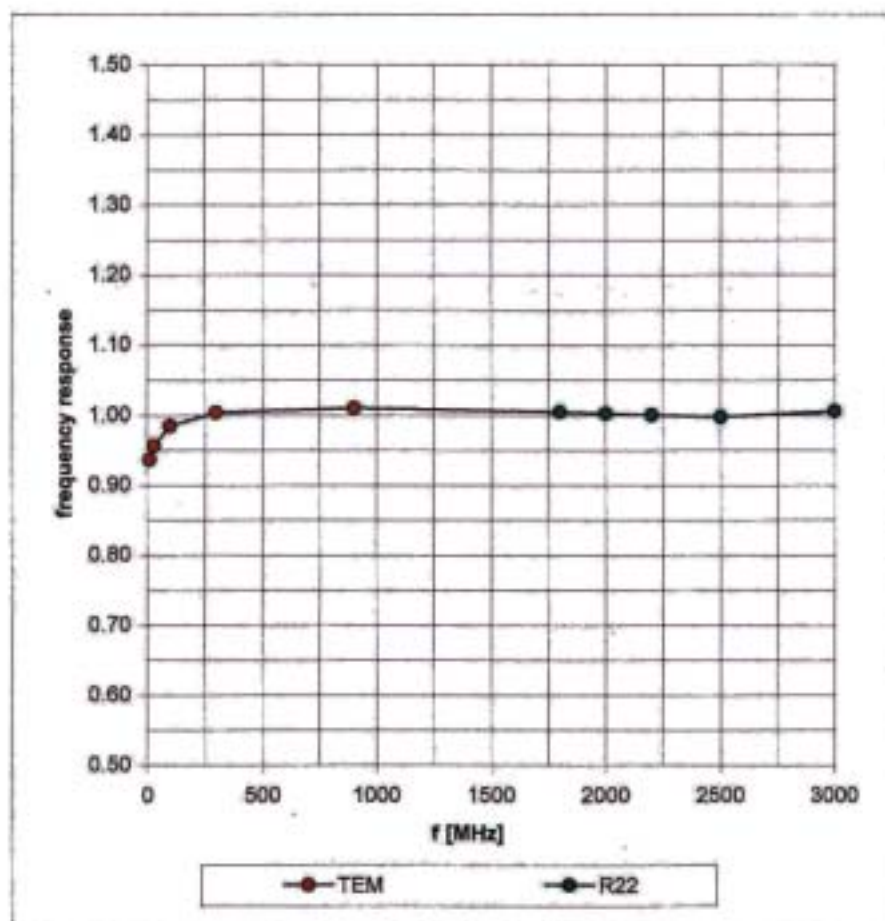


Isotropy Error (ϕ), $\theta = 0^\circ$

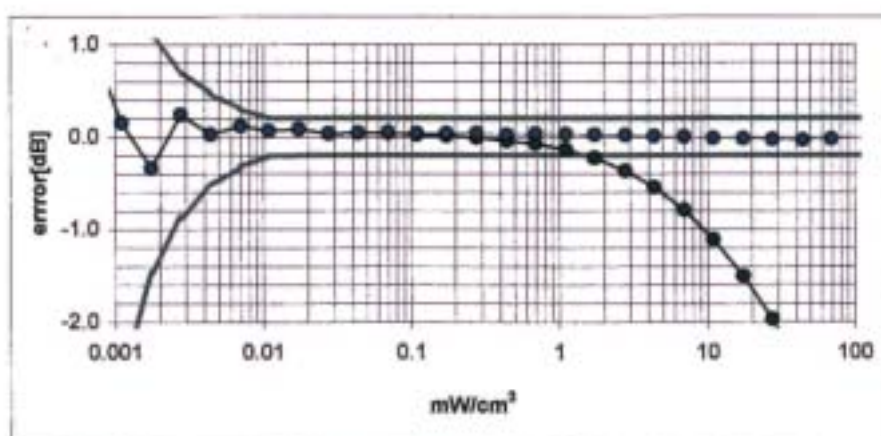
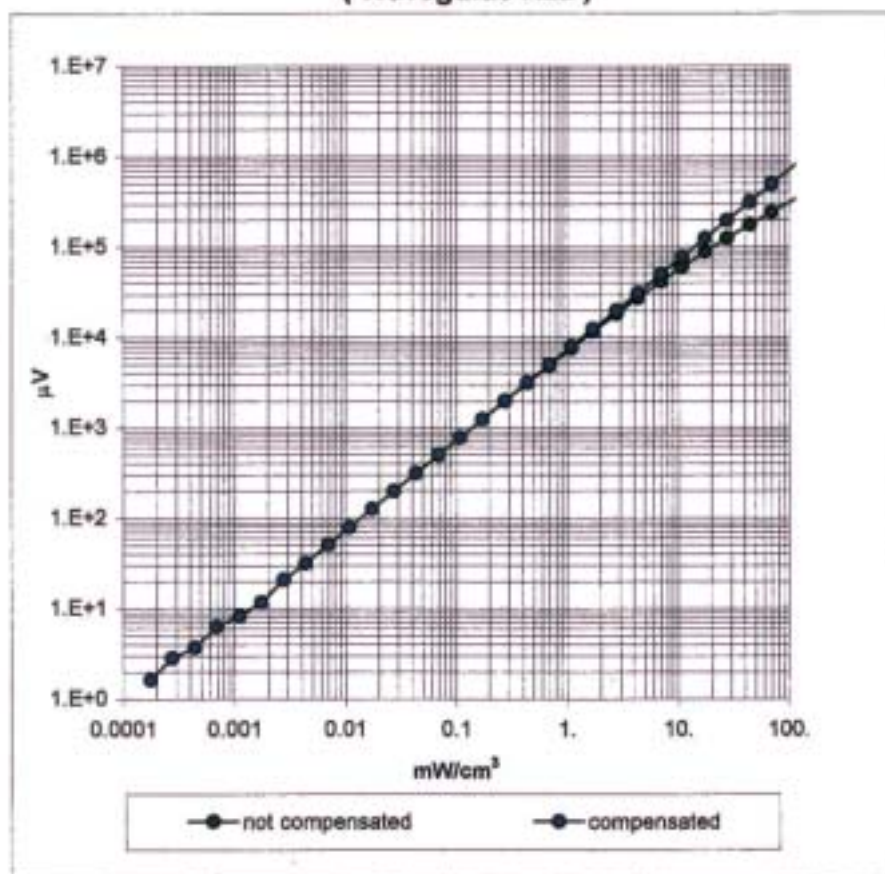


Frequency Response of E-Field

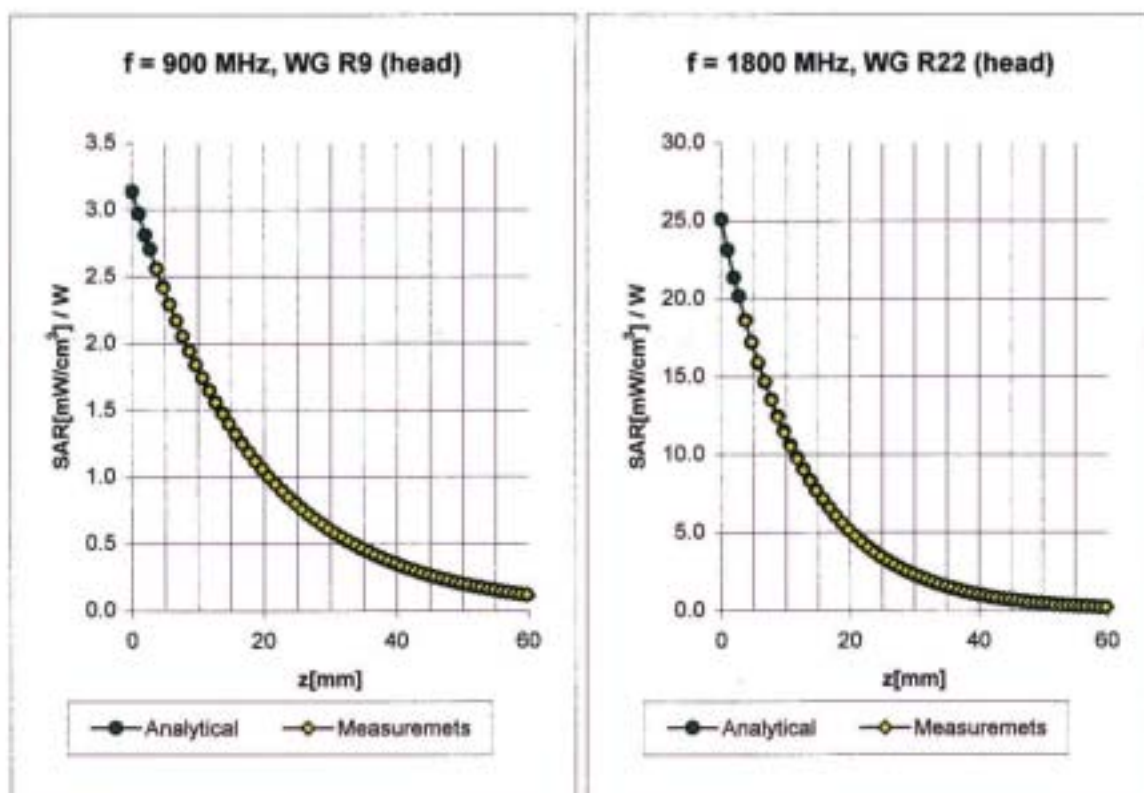
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range $f(\text{SAR}_{\text{brain}})$ (Waveguide R22)

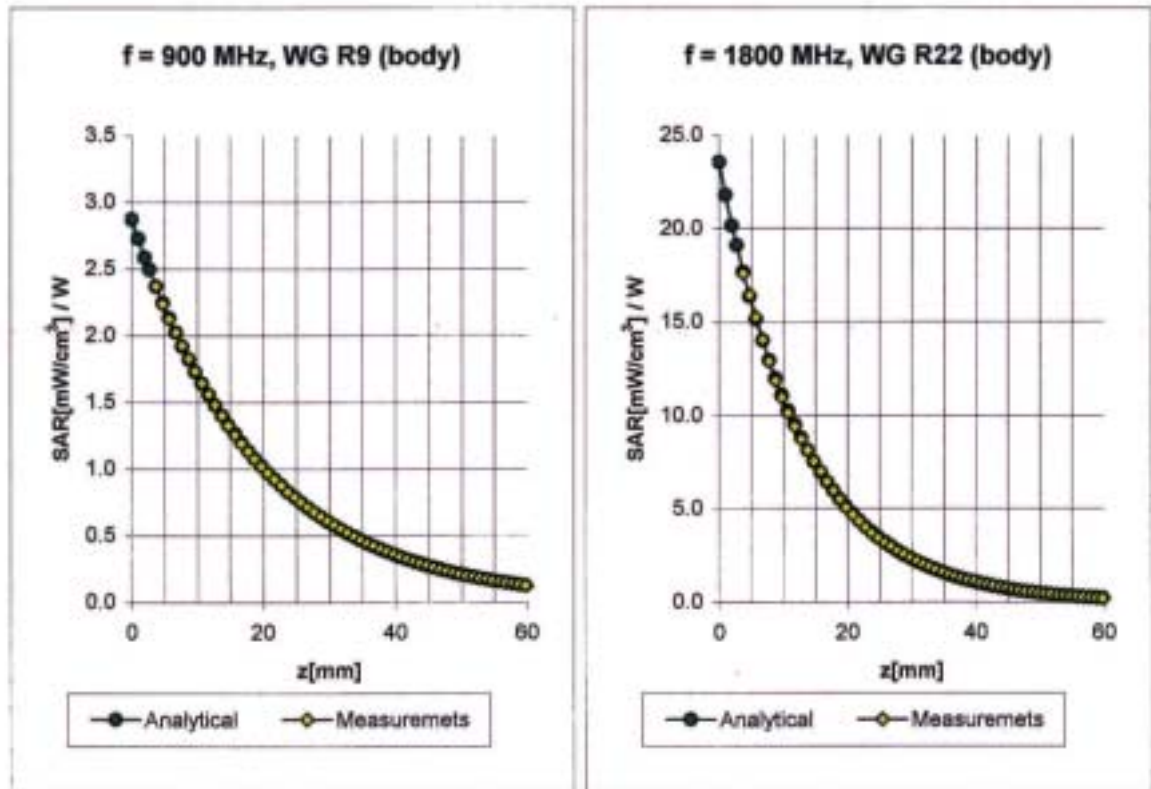


Conversion Factor Assessment



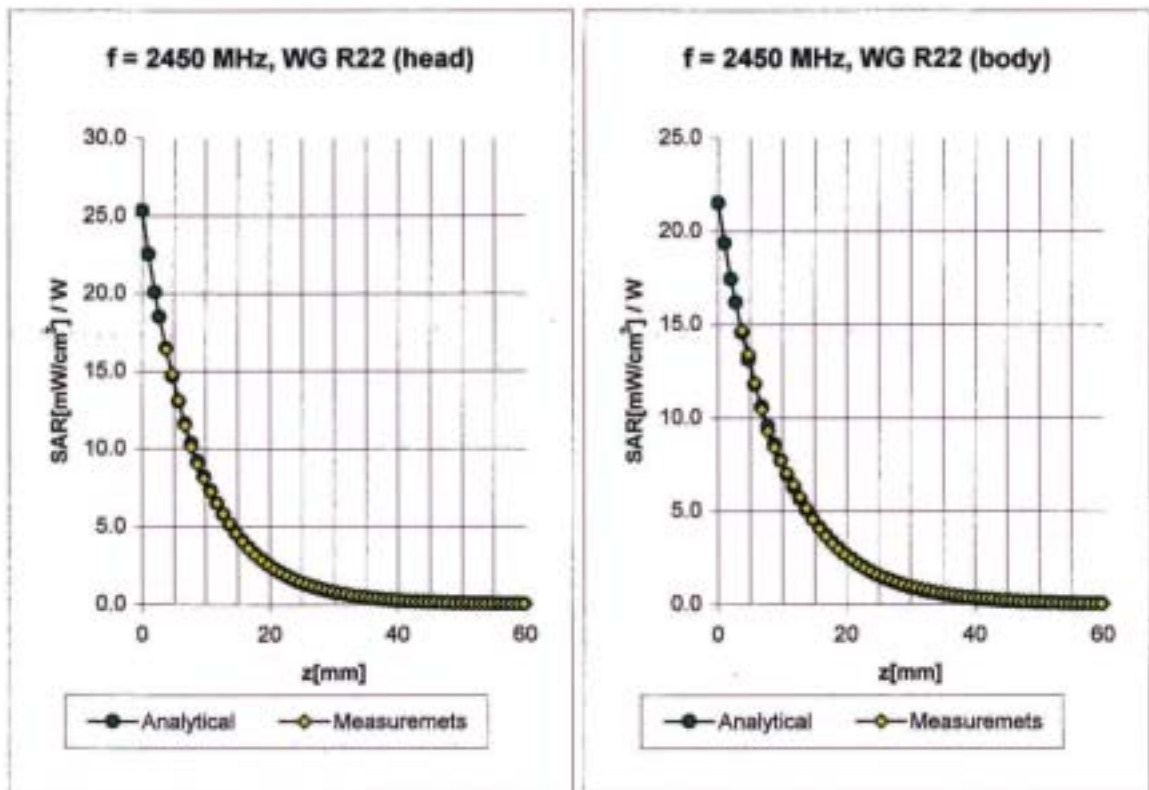
Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\% \text{ mho/m}$
	ConvF X	$6.7 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.7 \pm 9.5\% (k=2)$	Alpha 0.67
	ConvF Z	$6.7 \pm 9.5\% (k=2)$	Depth 1.74
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
	ConvF X	$5.4 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$5.4 \pm 9.5\% (k=2)$	Alpha 0.50
	ConvF Z	$5.4 \pm 9.5\% (k=2)$	Depth 2.63

Conversion Factor Assessment



Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$\sigma = 1.05 \pm 5\% \text{ mho/m}$
Body	835 MHz	$\epsilon_r = 55.2 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
	ConvF X	$6.5 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$6.5 \pm 9.5\% (k=2)$	Alpha 0.43
	ConvF Z	$6.5 \pm 9.5\% (k=2)$	Depth 2.34
Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
Body	1900 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
	ConvF X	$5.0 \pm 9.5\% (k=2)$	Boundary effect:
	ConvF Y	$5.0 \pm 9.5\% (k=2)$	Alpha 0.57
	ConvF Z	$5.0 \pm 9.5\% (k=2)$	Depth 2.65

Conversion Factor Assessment



Head 2450 MHz $\epsilon_r = 39.2 \pm 5\%$ $\sigma = 1.80 \pm 5\%$ mho/m

ConvF X **5.1 $\pm$ 8.9% (k=2)**

Boundary effect:

ConvF Y **5.1 $\pm$ 8.9% (k=2)**

Alpha **1.32**

ConvF Z **5.1 $\pm$ 8.9% (k=2)**

Depth **1.61**

Body 2450 MHz $\epsilon_r = 52.7 \pm 5\%$ $\sigma = 1.95 \pm 5\%$ mho/m

ConvF X **4.6 $\pm$ 8.9% (k=2)**

Boundary effect:

ConvF Y **4.6 $\pm$ 8.9% (k=2)**

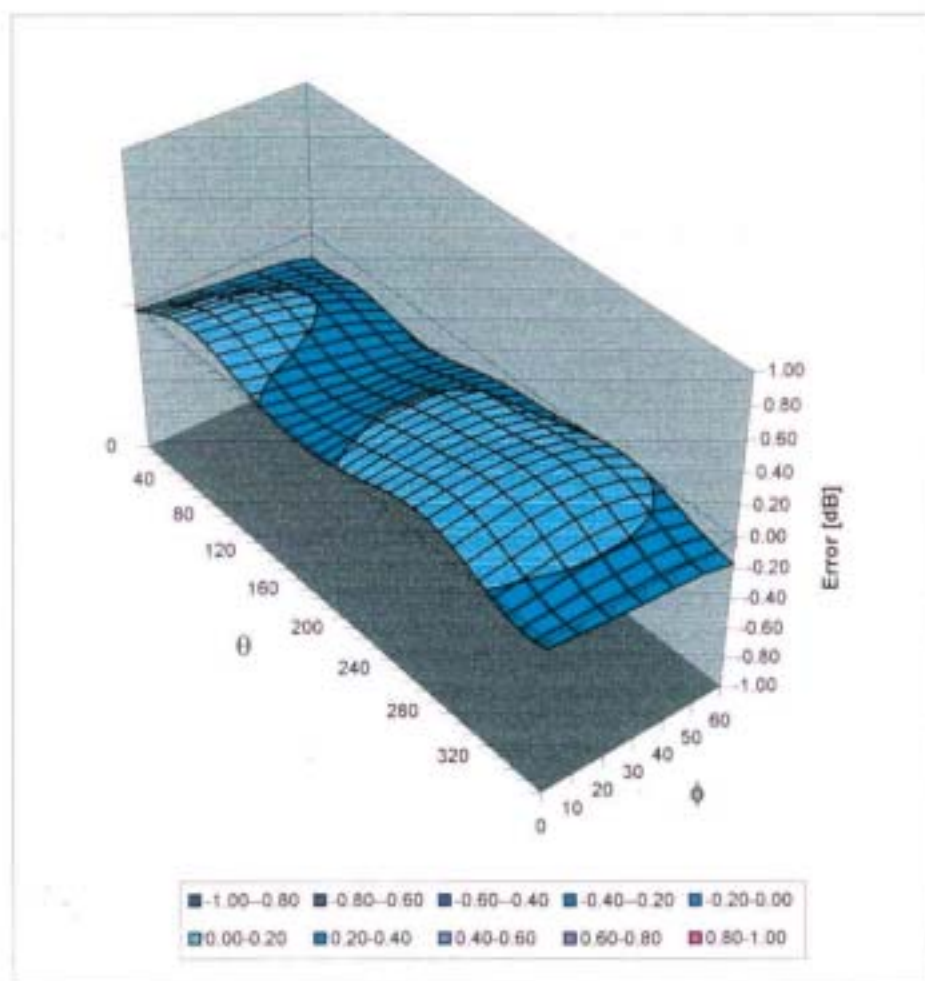
Alpha **1.39**

ConvF Z **4.6 $\pm$ 8.9% (k=2)**

Depth **1.60**

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



Client **C&C (Auden)**

CALIBRATION CERTIFICATE

Object(s) **D2450V2 - SN:728**

Calibration procedure(s) **QA CAL-05.v2
Calibration procedure for dipole validation kits**

Calibration date: **March 5, 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 R&S SML-03	100598	27-Mar-2002	In house check: Mar-05
Power sensor HP 8481A	MY41092317	18-Oct-02	Oct-04
Power sensor HP 8481A	US37292783	30-Oct-02	Oct-03
Power meter EPM E442	GB37480704	30-Oct-02	Oct-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03

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

Date issued: April 2, 2003

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

DASY

Dipole Validation Kit

Type: D2450V2

Serial: 728

Manufactured: January 9, 2003

Calibrated: March 5, 2003

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with head simulating solution of the following electrical parameters at 2450 MHz:

Relative Dielectricity	37.4	$\pm 5\%$
Conductivity	1.88 mho/m	$\pm 5\%$

The DASY4 System with a dosimetric E-field probe ES3DV2 (SN:3013, Conversion factor 4.8 at 2450 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.

The dipole input power (forward power) was $250\text{mW} \pm 3\%$. The results are normalized to 1W input power.

2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ES3DV2 SN:3013 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	54.8 mW/g $\pm 16.8\%$ ($k=2$)¹
averaged over 10 cm^3 (10 g) of tissue:	24.2 mW/g $\pm 16.2\%$ ($k=2$)¹

¹ validation uncertainty

3. Dipole Impedance and Return Loss

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

Electrical delay:	1.153 ns	(one direction)
Transmission factor:	0.997	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 2450 MHz:	$\text{Re}\{Z\} = 53,7 \, \Omega$
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	$\text{Im}\{Z\} = 3,8 \, \Omega$
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Return Loss at 2450 MHz	-25,9 dB
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4. Handling

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

5. Design

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

Small end caps have been added to the dipole arms in order to improve matching when loaded according to the position as explained in Section 1. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

6. Power Test

After long term use with 40W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

Date/Time: 03/05/03 12:24:05

Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN728_SN3013_HSL2450_050303.da4

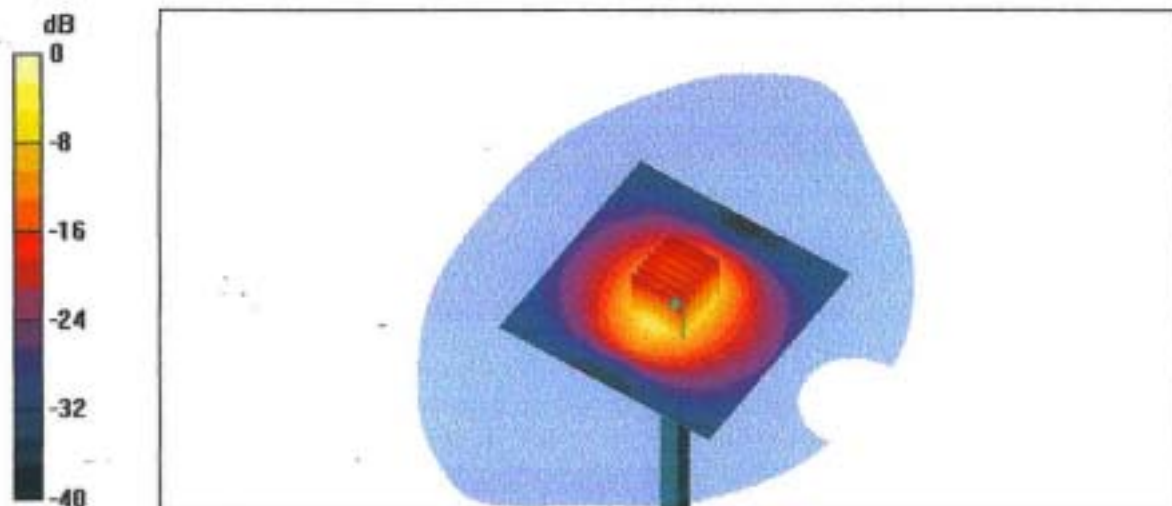
DUT: Dipole 2450 MHz; Serial: D2450V2 - SN728
Program: Dipole Calibration

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL 2450 MHz; ($\sigma = 1.88 \text{ mho/m}$, $\epsilon_r = 37.4$, $\rho = 1000 \text{ kg/m}^3$)
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV2 - SN3013; ConvF(4.8, 4.8, 4.8); Calibrated: 1/19/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 25; Postprocessing SW: SEMCAD, V1.6 Build 105

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.6 V/m
Peak SAR = 30.6 W/kg
SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.04 mW/g
Power Drift = 0.02 dB

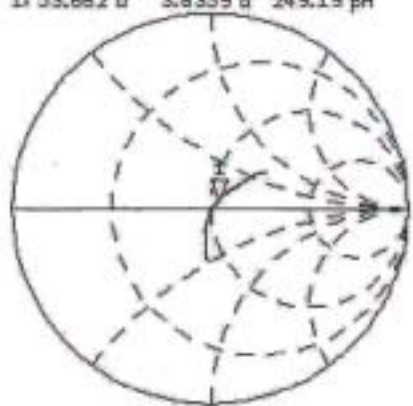


CH1 S11 1 U F9 5 Mar 2003 18:02:21
 f: 53.662 a 3.8359 a 249.19 pH 2 450.000 000 MHz

728
 Head

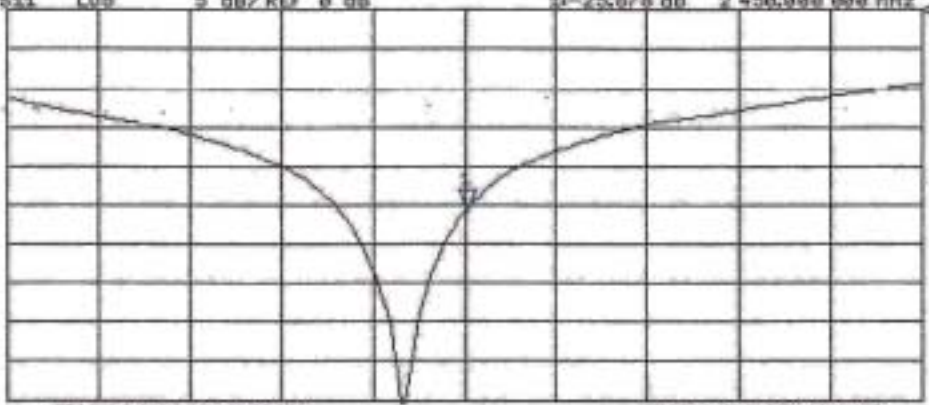
De1

PRn
 Cor
 Avg
 16



CH2 S11 LOS 5 dB/REF 0 dB f: 25.078 dB 2 450.000 000 MHz

PRn
 Cor



START 2 250.000 000 MHz STOP 2 650.000 000 MHz

Test Laboratory: Compliance Certification Services Inc.

D2450V2 SN 728

DUT: Dipole 2450 MHz; Type: D2450V2; Serial:728

Communication System: CW2450; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450 ($\sigma = 1.811$ mho/m, $\epsilon_r = 39$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ; Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(5.1, 5.1, 5.1); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 34; Type: SAM V4.0; Serial: TP-1150
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

Pin=250mW,d=10mm/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 96.8 V/m

Power Drift = 0.0 dB

Maximum value of SAR = 11.1 mW/g

Pin=250mW,d=10mm/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 96.8 V/m

Power Drift = 0.0 dB

Maximum value of SAR = 23 mW/g

Pin=250mW,d=10mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

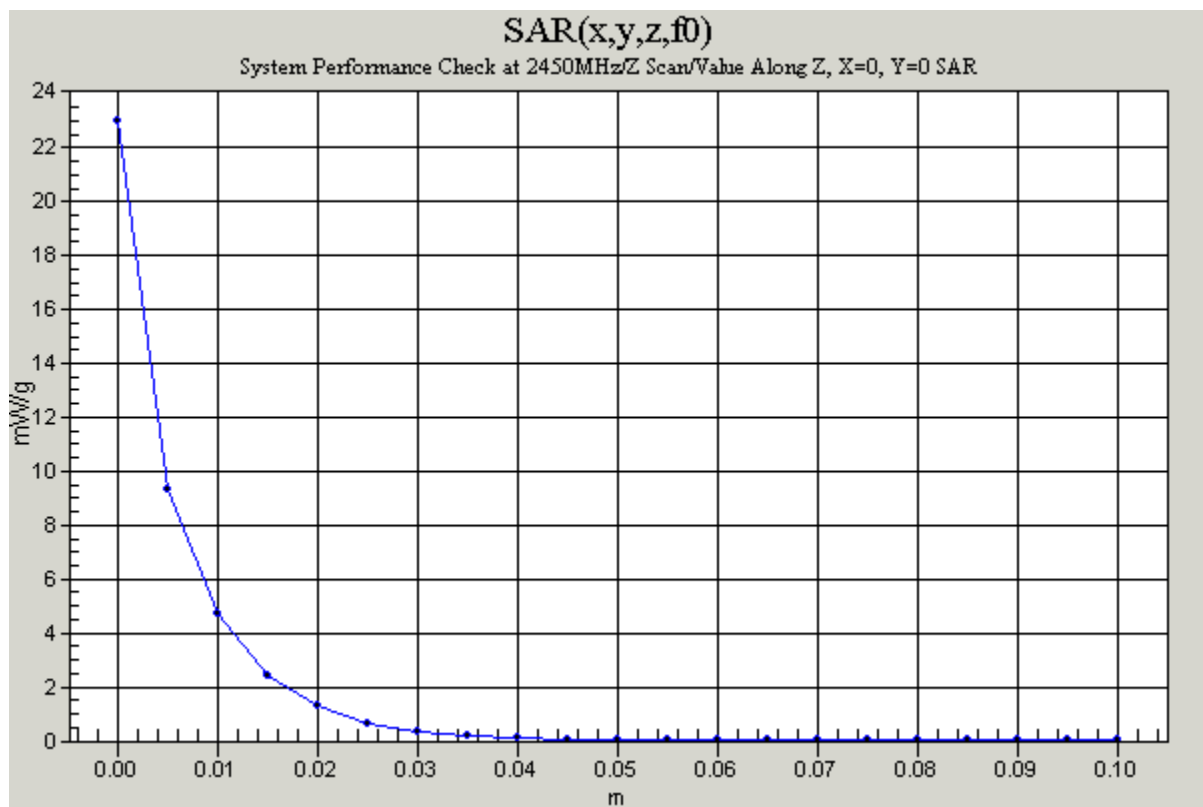
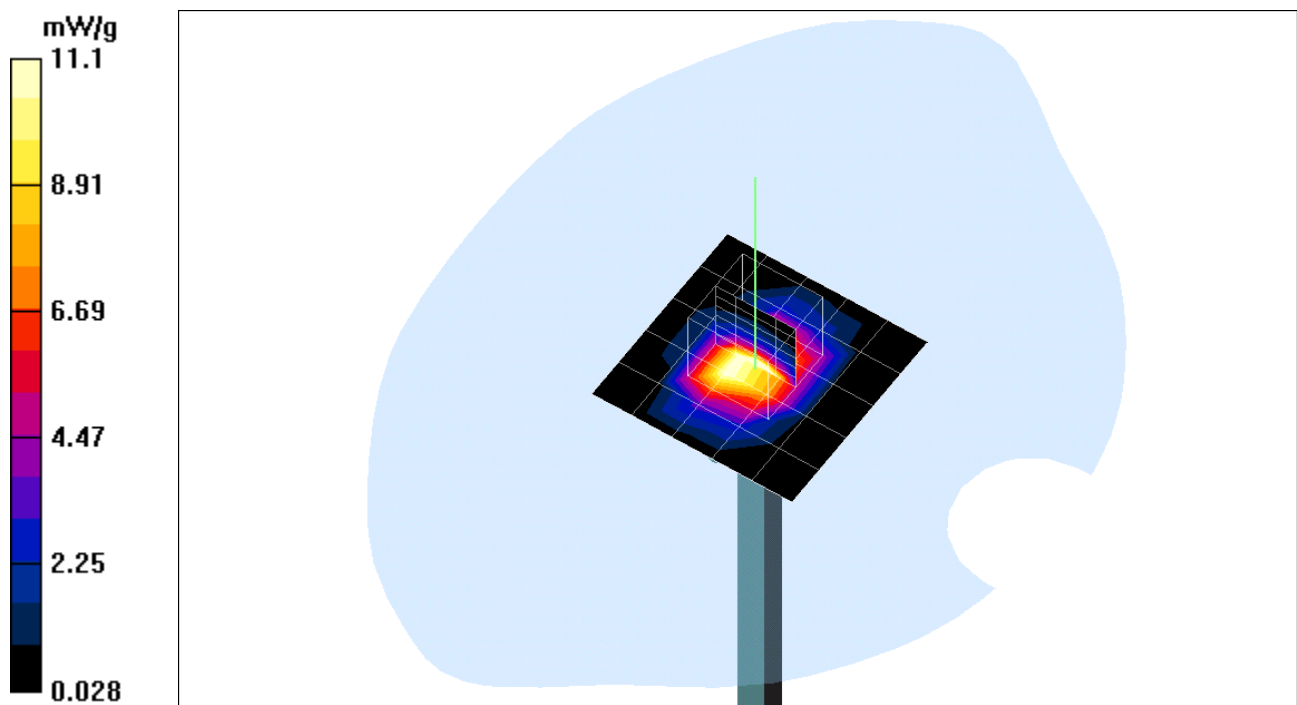
Peak SAR (extrapolated) = 30.5 W/kg

SAR(1 g) = 14.1 mW/g; SAR(10 g) = 6.5 mW/g

Reference Value = 96.8 V/m

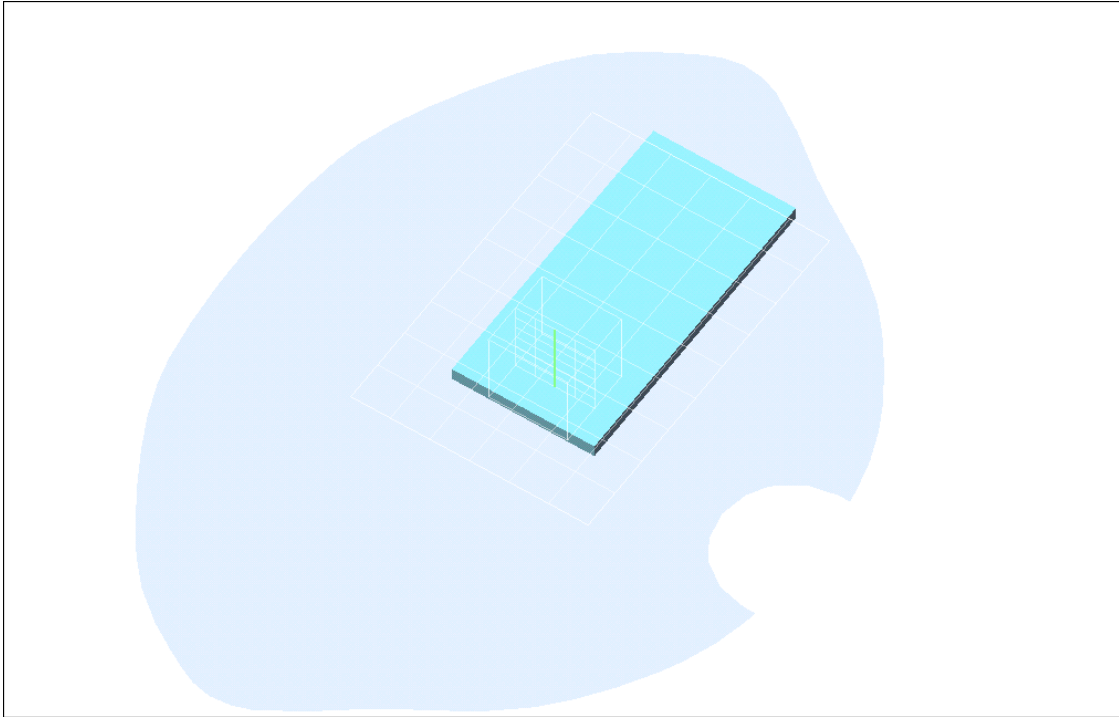
Power Drift = 0.0 dB

Maximum value of SAR = 15.9 mW/g



Test Laboratory: Compliance Certification Services Inc.

Test Configuration-1



Test Laboratory: Compliance Certification Services Inc.

Touch mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: 802.11b Wireless LAN Cardbus PC Card ; Frequency: 2412 MHz;Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2$ mho/m, $\epsilon_r = 51$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ;Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

Low Rate=11M bit/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 12.4 V/m

Power Drift = 0.2 dB

Maximum value of SAR = 0.379 mW/g

Low Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 12.4 V/m

Power Drift = 0.2 dB

Maximum value of SAR = 0.404 mW/g

Low Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

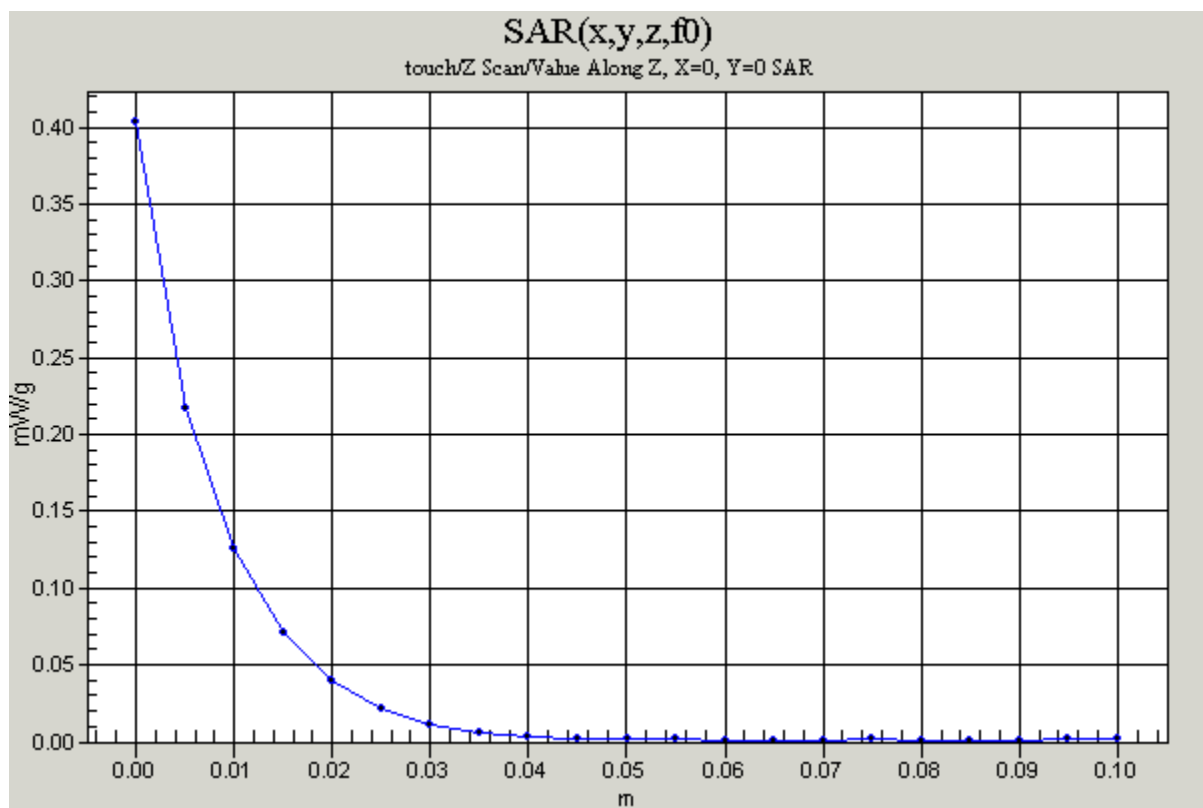
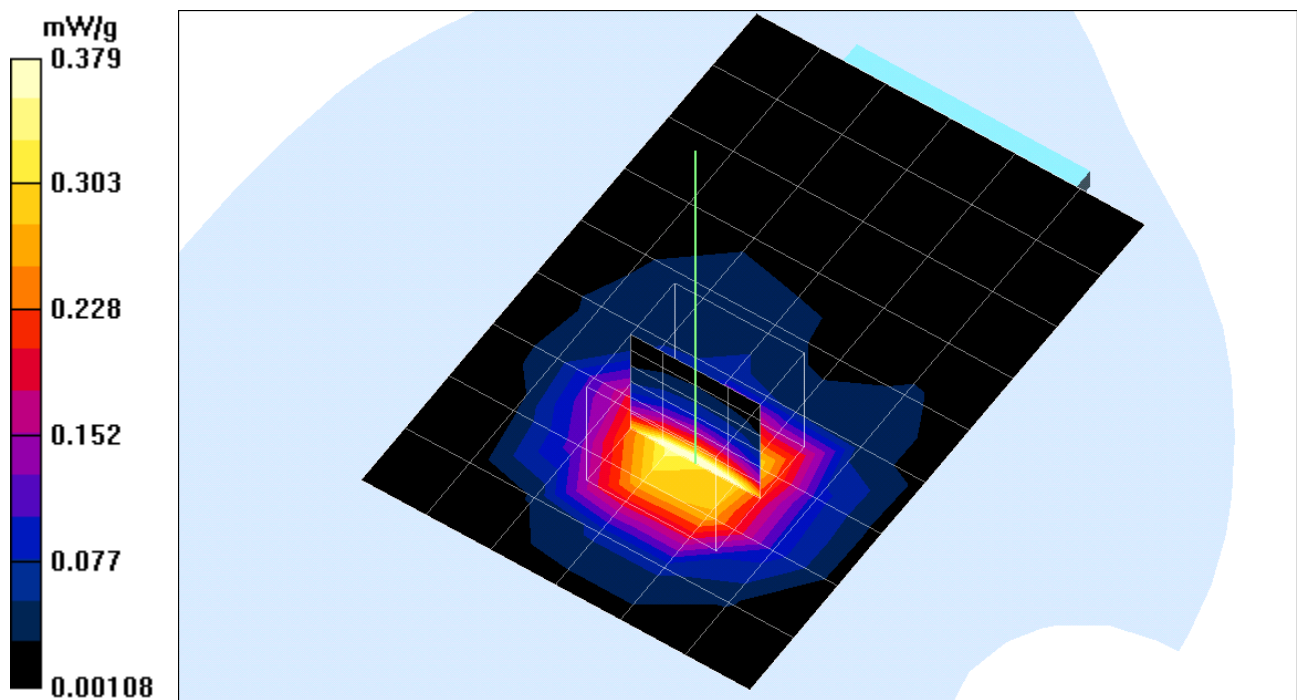
Peak SAR (extrapolated) = 0.885 W/kg

SAR(1 g) = 0.427 mW/g; SAR(10 g) = 0.217 mW/g

Reference Value = 12.4 V/m

Power Drift = 0.2 dB

Maximum value of SAR = 0.467 mW/g



Test Laboratory: Compliance Certification Services Inc.

Touch mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: 802.11b Wireless LAN Cardbus PC Card ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2$ mho/m, $\epsilon_r = 51$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ;Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

mid Rate=11M bit/Area Scan (7x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 12.9 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.337 mW/g

mid Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 12.9 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.355 mW/g

mid Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

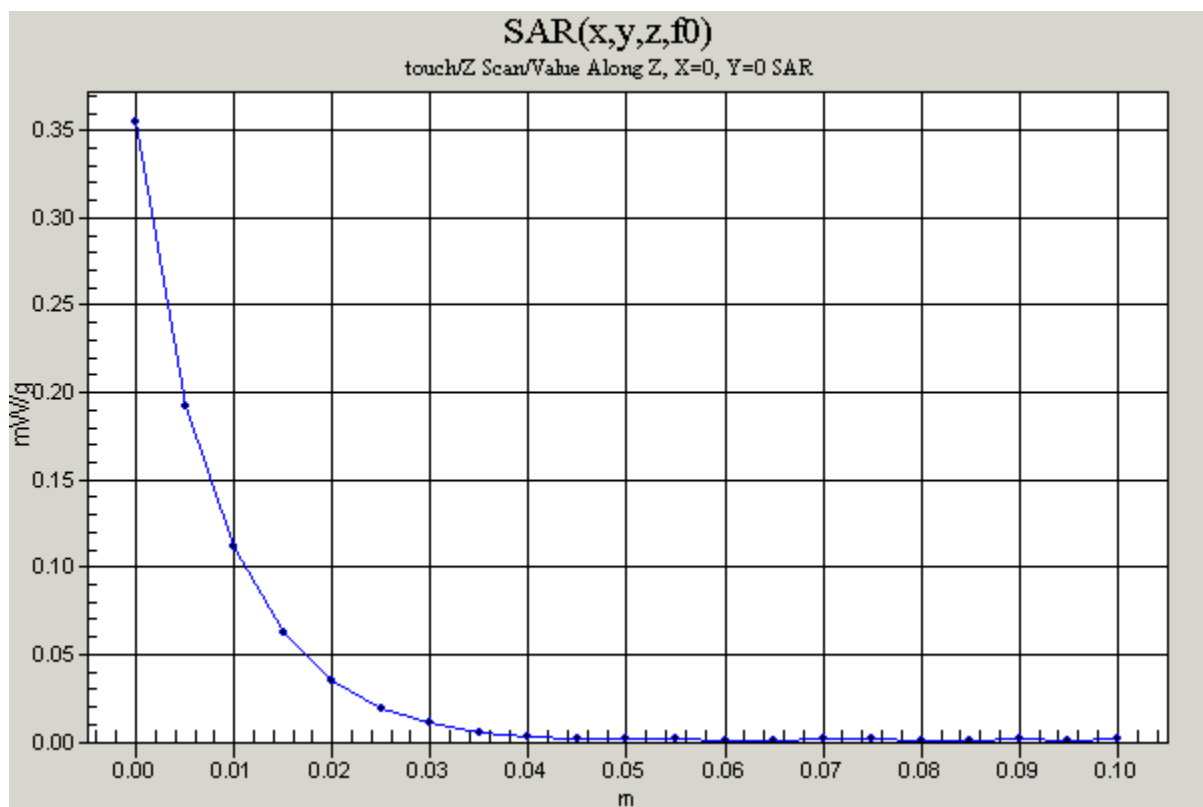
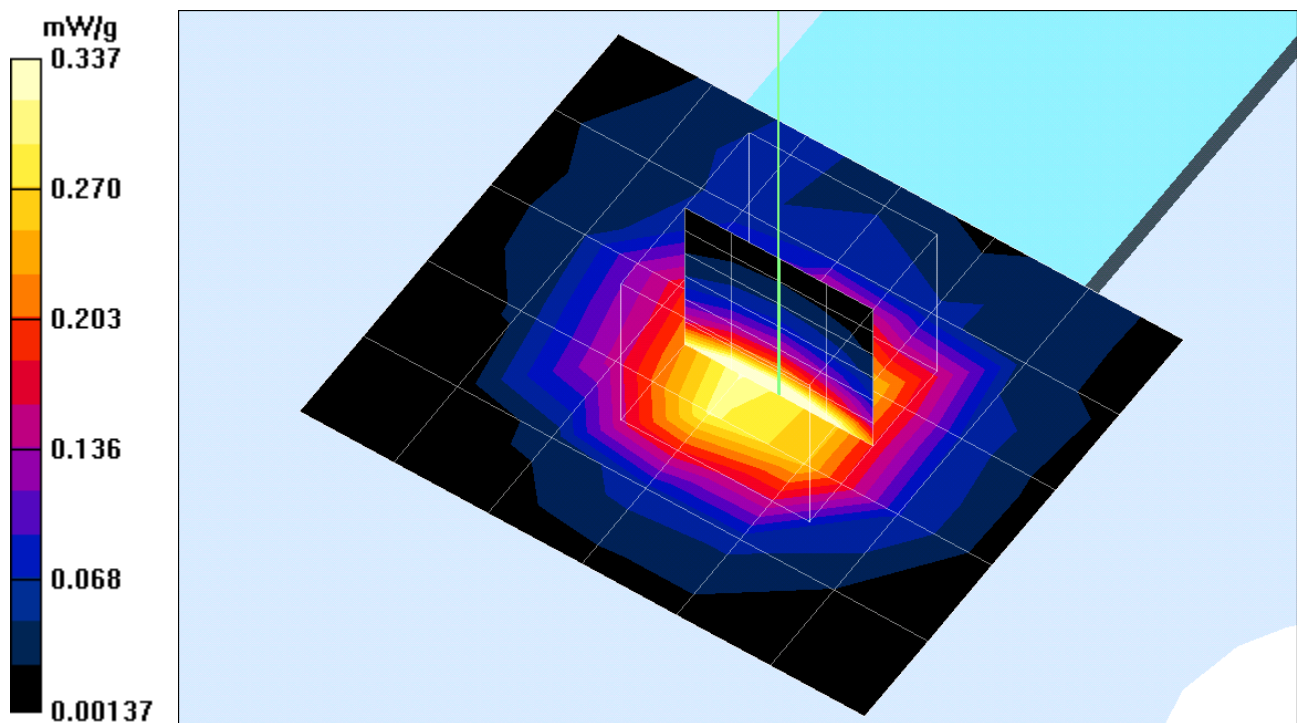
Peak SAR (extrapolated) = 0.826 W/kg

SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.200 mW/g

Reference Value = 12.9 V/m

Power Drift = -0.2 dB

Maximum value of SAR = 0.427 mW/g



Test Laboratory: Compliance Certification Services Inc.

Touch mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: 802.11b Wireless LAN Cardbus PC Card ; Frequency: 2462 MHz;Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2$ mho/m, $\epsilon_r = 51$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ;Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

High Rate=11M bit/Area Scan (7x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 11.3 V/m

Power Drift = -0.4 dB

Maximum value of SAR = 0.221 mW/g

High Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 11.3 V/m

Power Drift = -0.5 dB

Maximum value of SAR = 0.216 mW/g

High Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

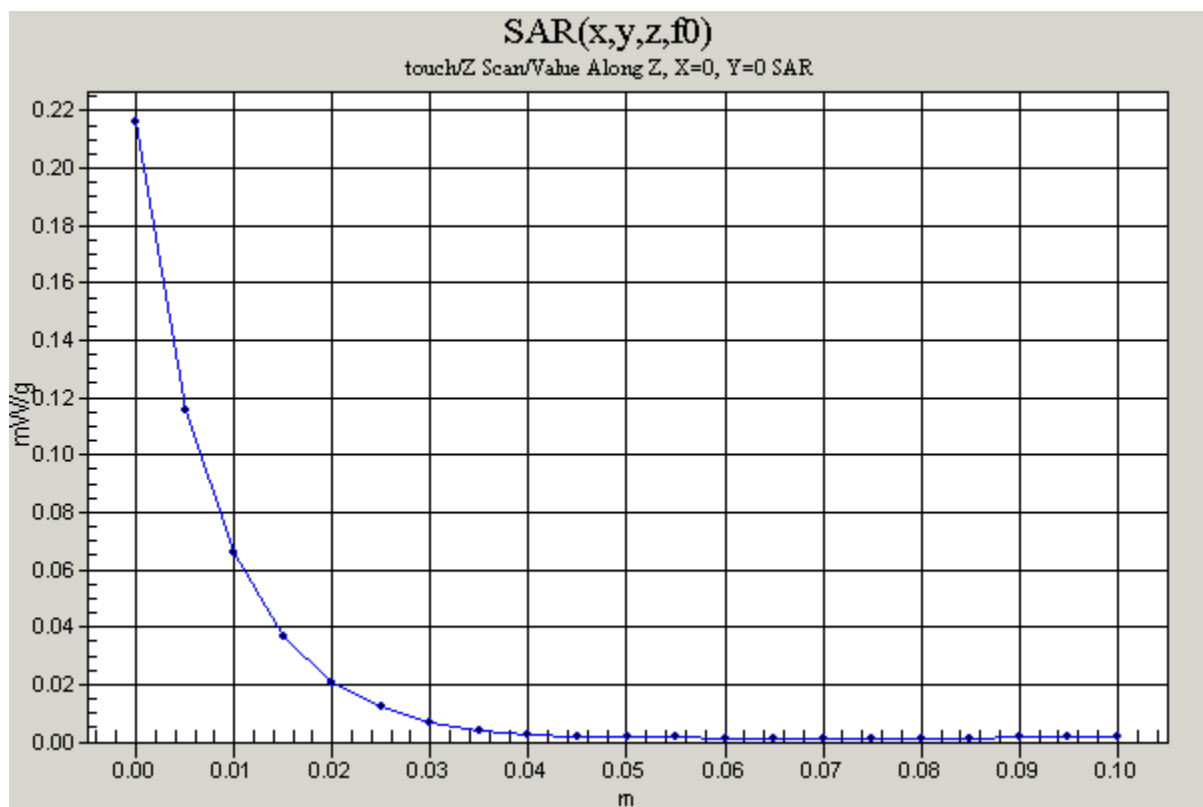
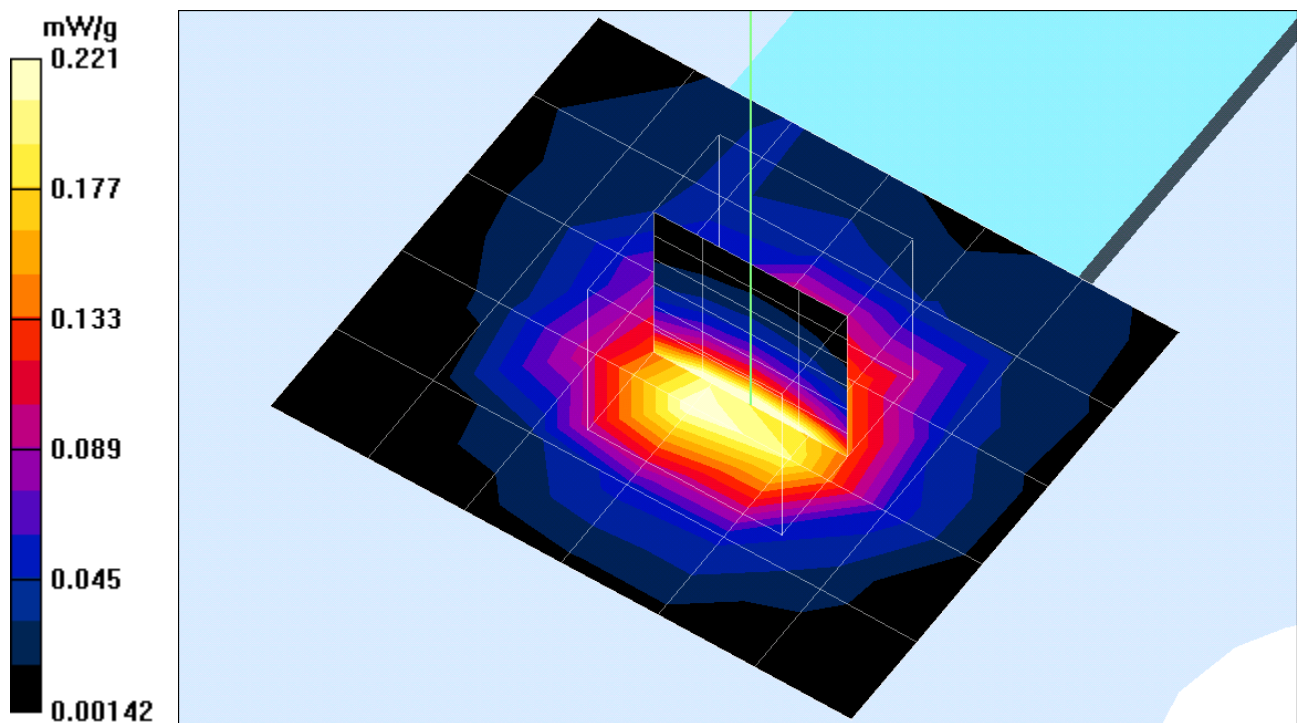
Peak SAR (extrapolated) = 0.496 W/kg

SAR(1 g) = 0.238 mW/g; SAR(10 g) = 0.121 mW/g

Reference Value = 11.3 V/m

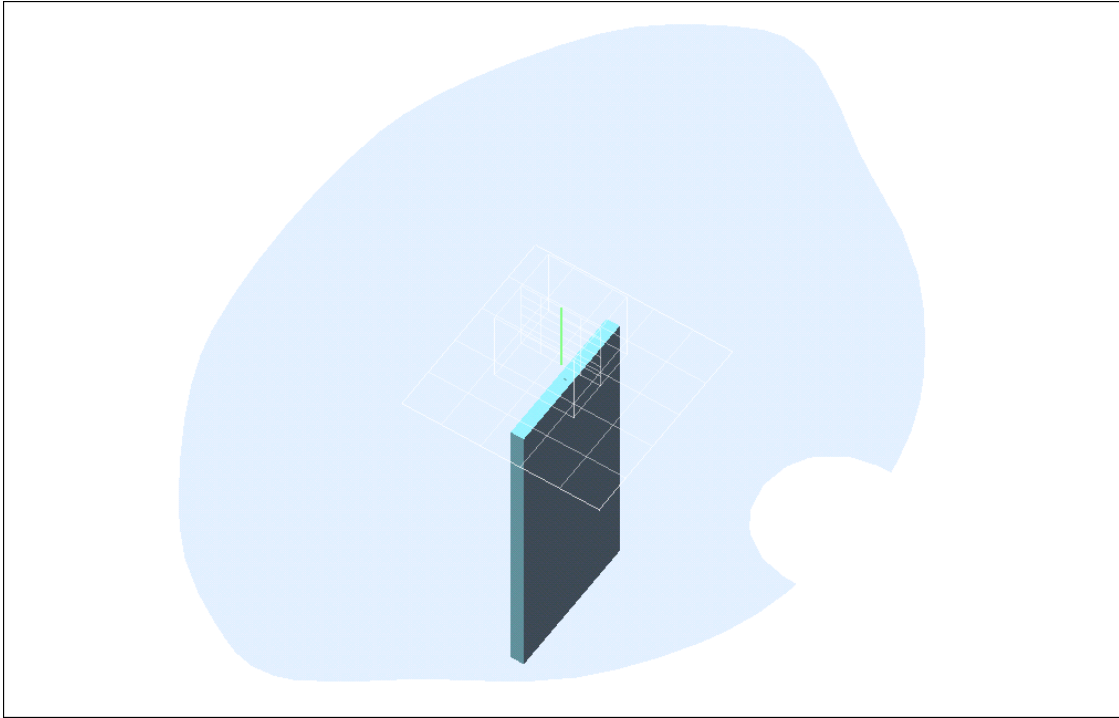
Power Drift = -0.4 dB

Maximum value of SAR = 0.256 mW/g



Test Laboratory: Compliance Certification Services Inc.

Test Configuration-2



Test Laboratory: Compliance Certification Services Inc.

15mm mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2$ mho/m, $\epsilon_r = 51$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ; Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

Low Rate=11M bit/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 7.71 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.100 mW/g

Low Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 7.71 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.096 mW/g

Low Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

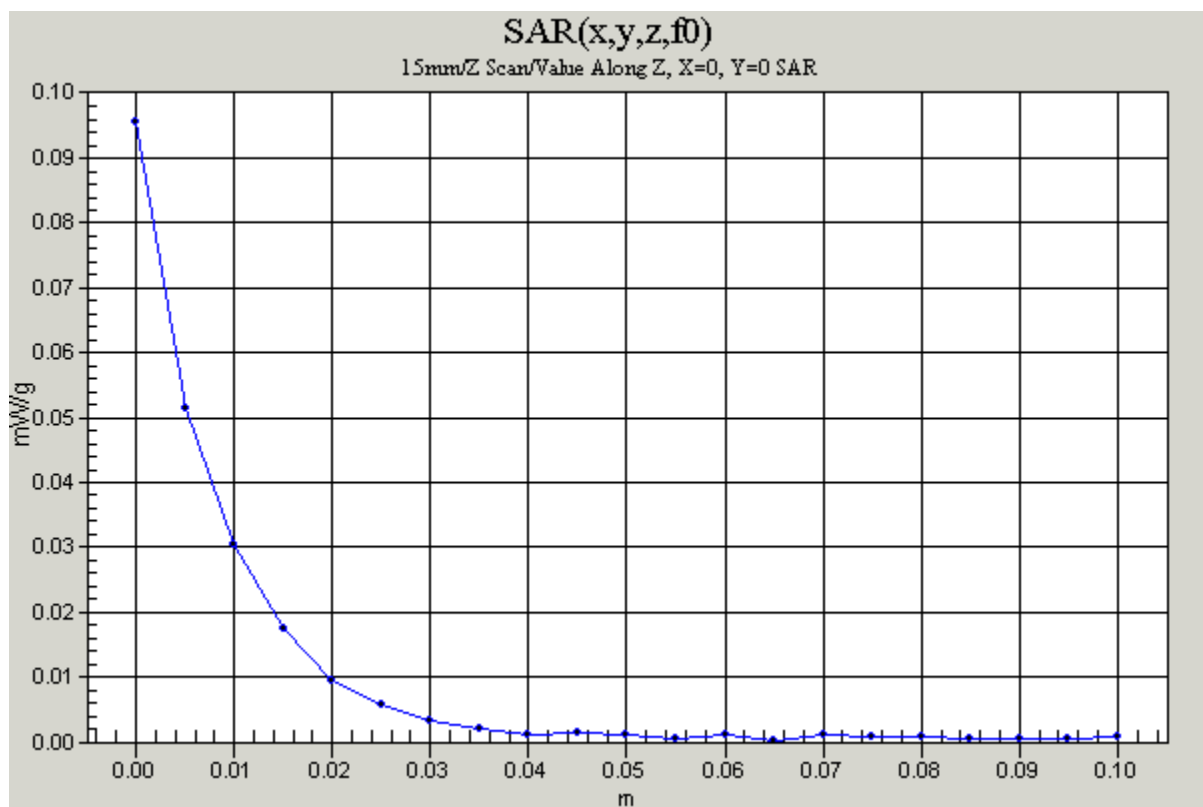
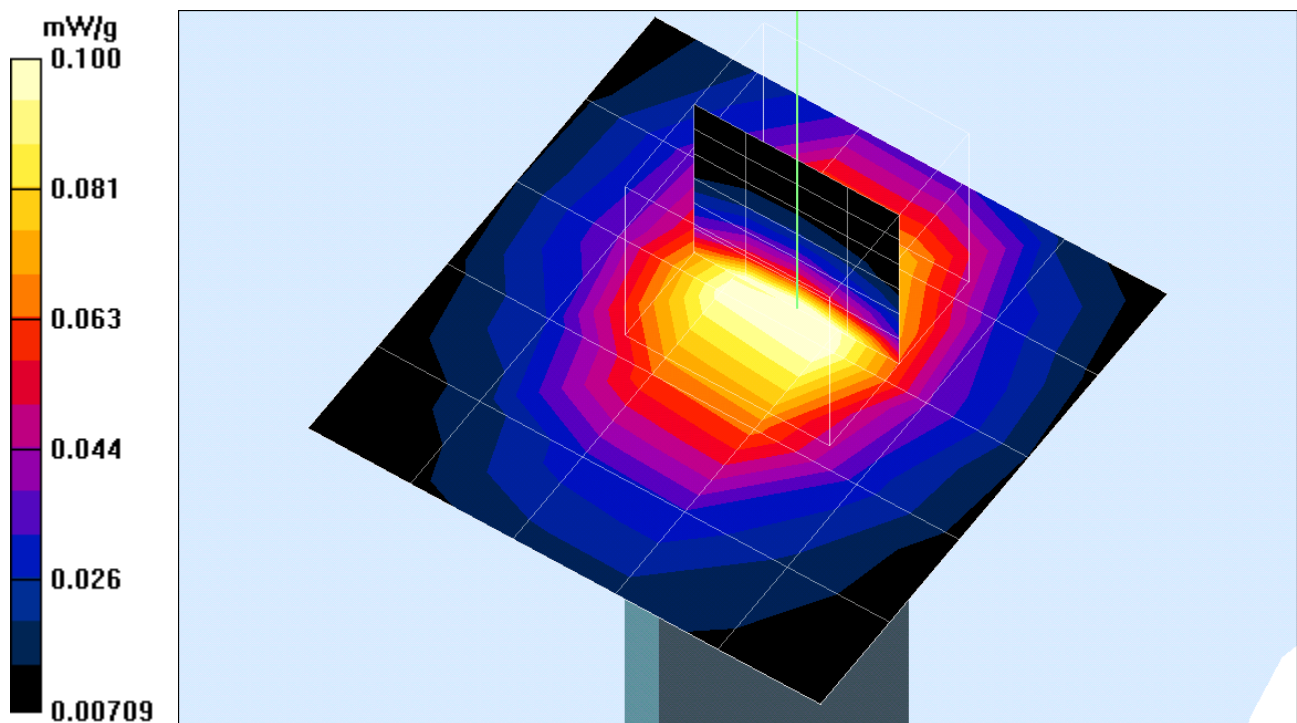
Peak SAR (extrapolated) = 0.215 W/kg

SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.059 mW/g

Reference Value = 7.71 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.113 mW/g



Test Laboratory: Compliance Certification Services Inc.

15mm mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2 \text{ mho/m}$, $\epsilon_r = 51$, $\rho = 1000 \text{ kg/m}^3$)

Air Temperature 25.2 deg C ; Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

mid Rate=11M bit/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 6.82 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.089 mW/g

mid Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 6.82 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.076 mW/g

mid Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

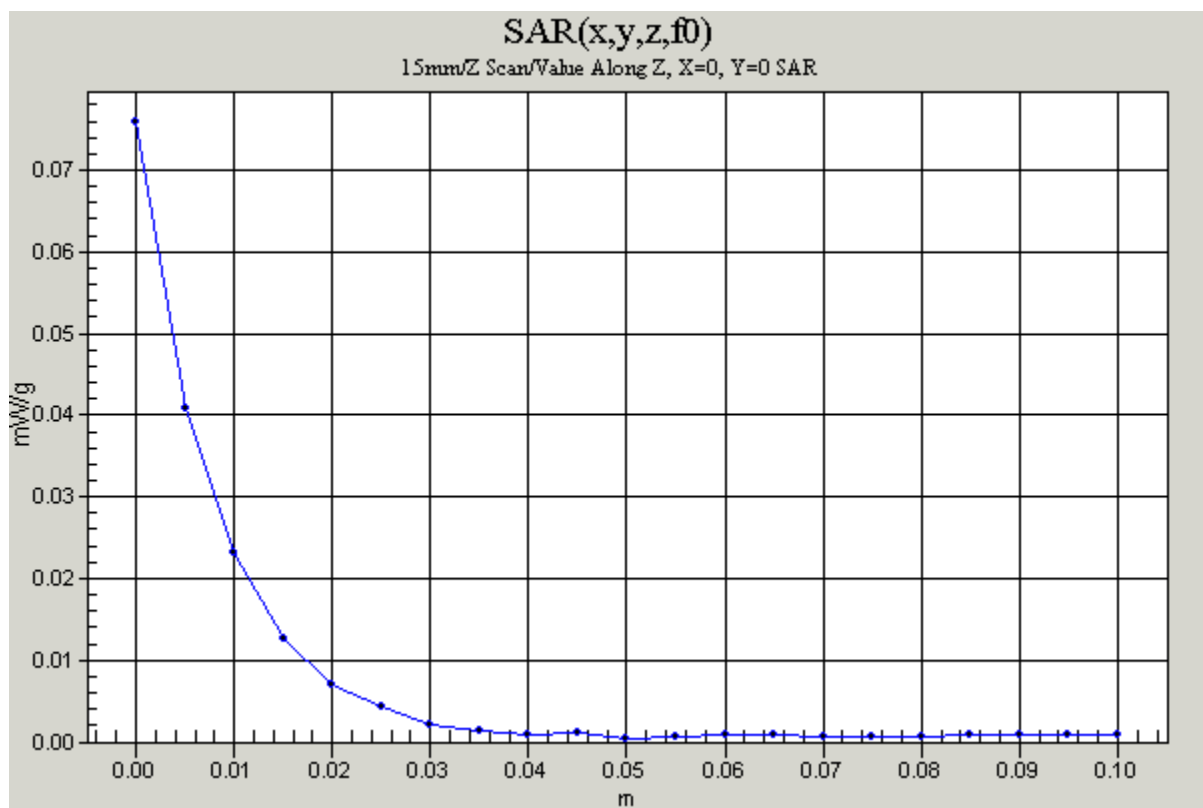
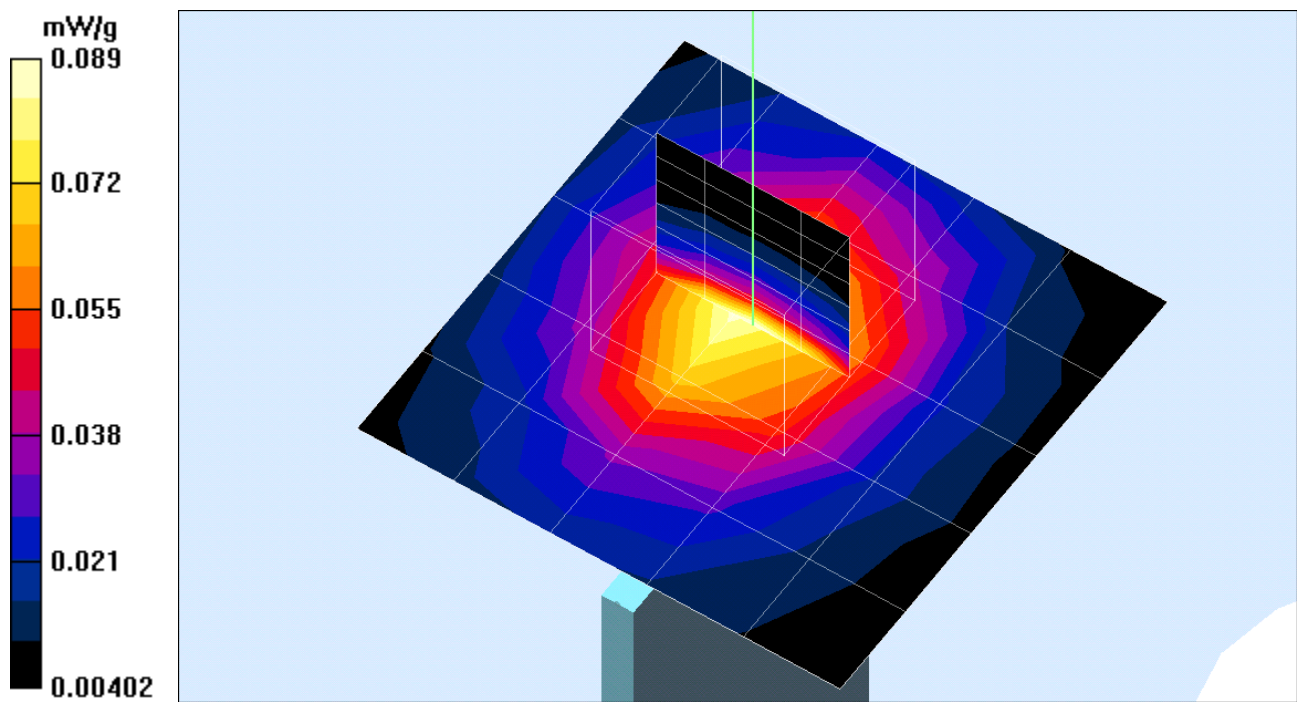
Peak SAR (extrapolated) = 0.171 W/kg

SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.046 mW/g

Reference Value = 6.82 V/m

Power Drift = -0.0 dB

Maximum value of SAR = 0.090 mW/g



Test Laboratory: Compliance Certification Services Inc.

15mm mode(with Compaq)

DUT: 802.11b Wireless LAN P3 Detachable Antenna PCMCIA Cardbus Card ; Type: WN-113SH18; Serial: N/A

Communication System: IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: BSL2450 ($\sigma = 2$ mho/m, $\epsilon_r = 51$, $\rho = 1000$ kg/m³)

Air Temperature 25.2 deg C ; Liquid Temperature 24 deg C

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1762; ConvF(4.6, 4.6, 4.6); Calibrated: 3/31/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn558; Calibrated: 3/7/2003
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1271
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 62

High Rate=11M bit/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 6.21 V/m

Power Drift = 0.0 dB

Maximum value of SAR = 0.071 mW/g

High Rate=11M bit/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Reference Value = 6.21 V/m

Power Drift = 0.0 dB

Maximum value of SAR = 0.062 mW/g

High Rate=11M bit/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Peak SAR (extrapolated) = 0.143 W/kg

SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.038 mW/g

Reference Value = 6.21 V/m

Power Drift = 0.0 dB

Maximum value of SAR = 0.074 mW/g

