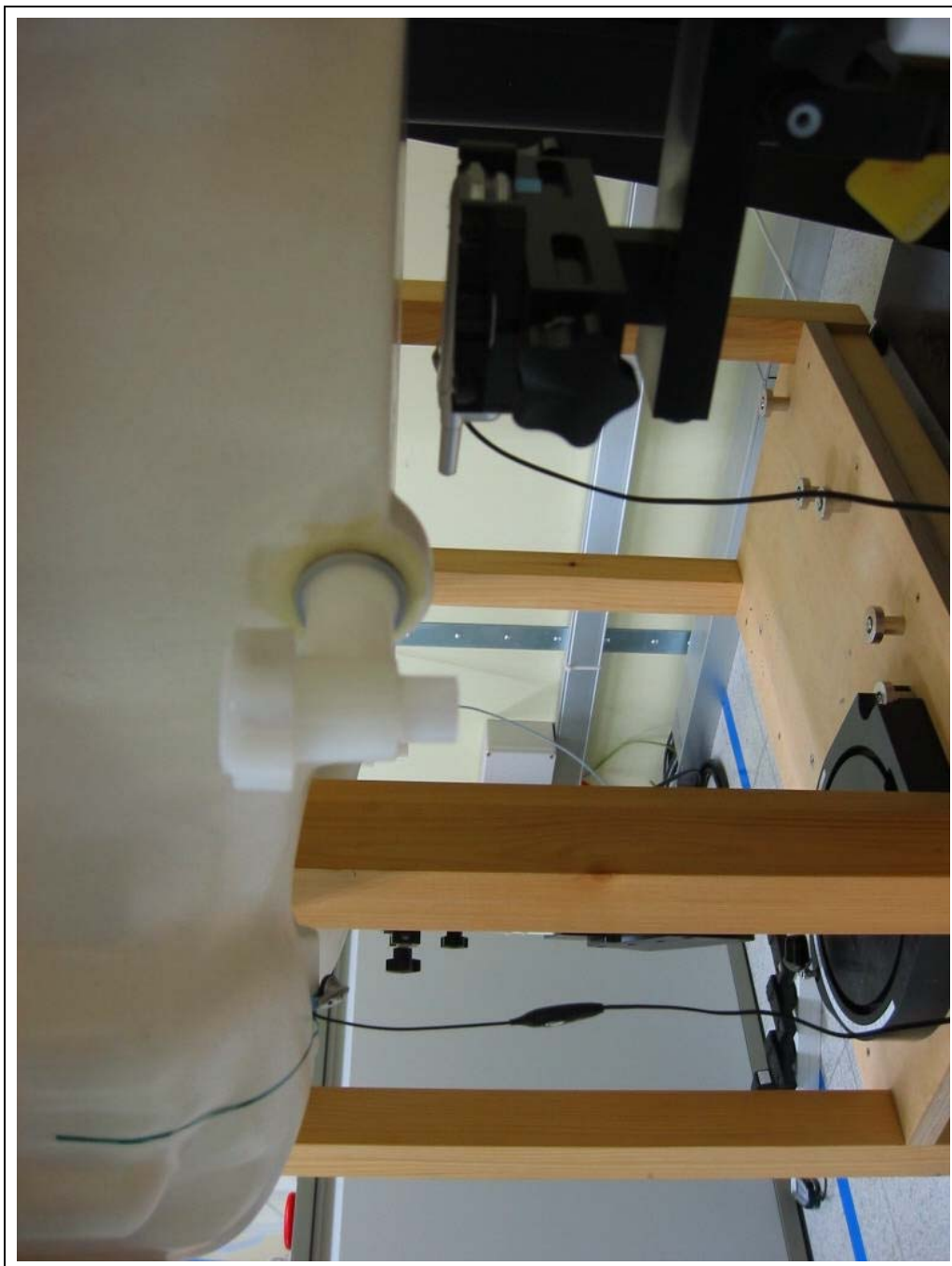




APPENDIX C : SAR Test Data

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 1013

Communication System: CDMA;Frequency: 824.7 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.6 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 1013 Left Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.2 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.894 mW/g

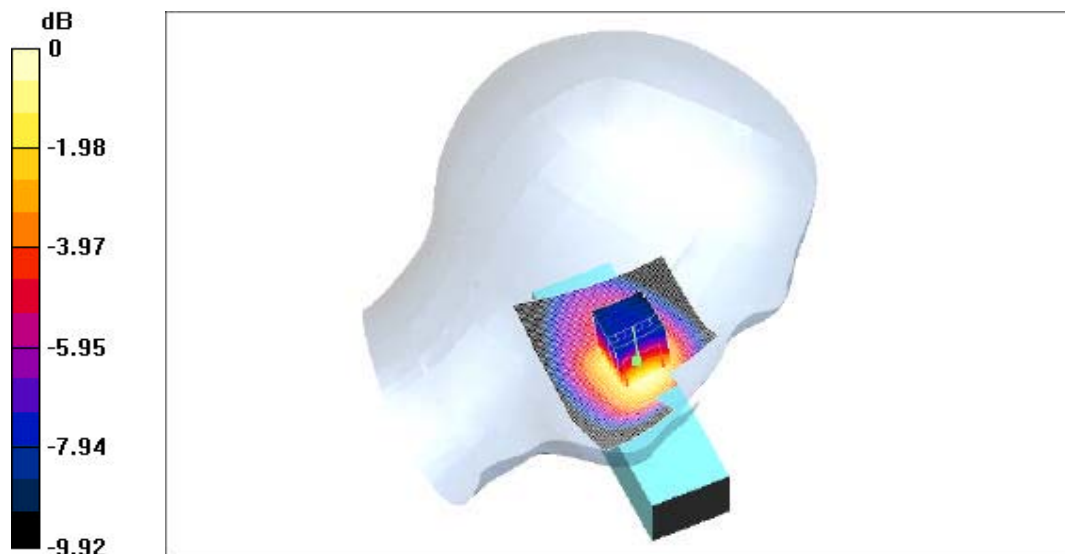
CDMA 1013 Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,
dz=5mm

Reference Value = 15.2 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.889 mW/g

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.82 mW/g; SAR(10 g) = 0.570 mW/g



0 dB = 0.889mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Left Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 16 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.33 mW/g

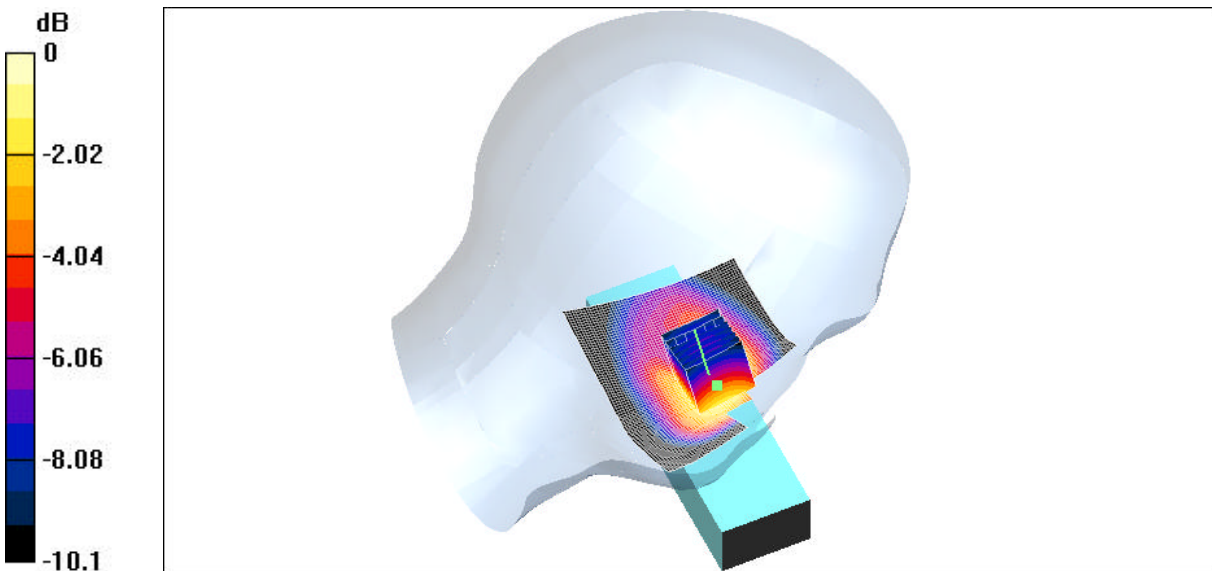
CDMA 363 Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.23 mW/g

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.780 mW/g



0 dB = 1.23mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 777

Communication System: CDMA;Frequency: 848.31 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 777 Left Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.6 V/m; Power Drift = -0.1 dB

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

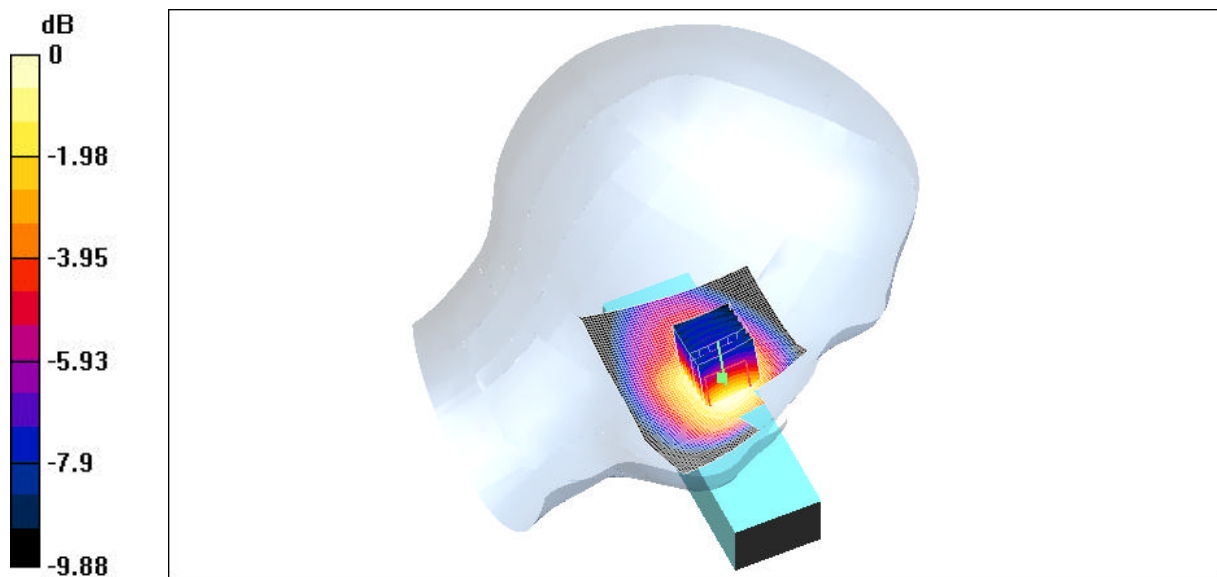
CDMA 777 Left Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.6 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.08 mW/g

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.693 mW/g



0 dB = 1.08mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Left Section

Test Date: 05/24/2004;Ambient Temp: 22.3 °C;Tissue Temp: 21.8 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Left Head Tilt/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 17.1 V/m; Power Drift = 0.004 dB

Maximum value of SAR (interpolated) = 0.368 mW/g

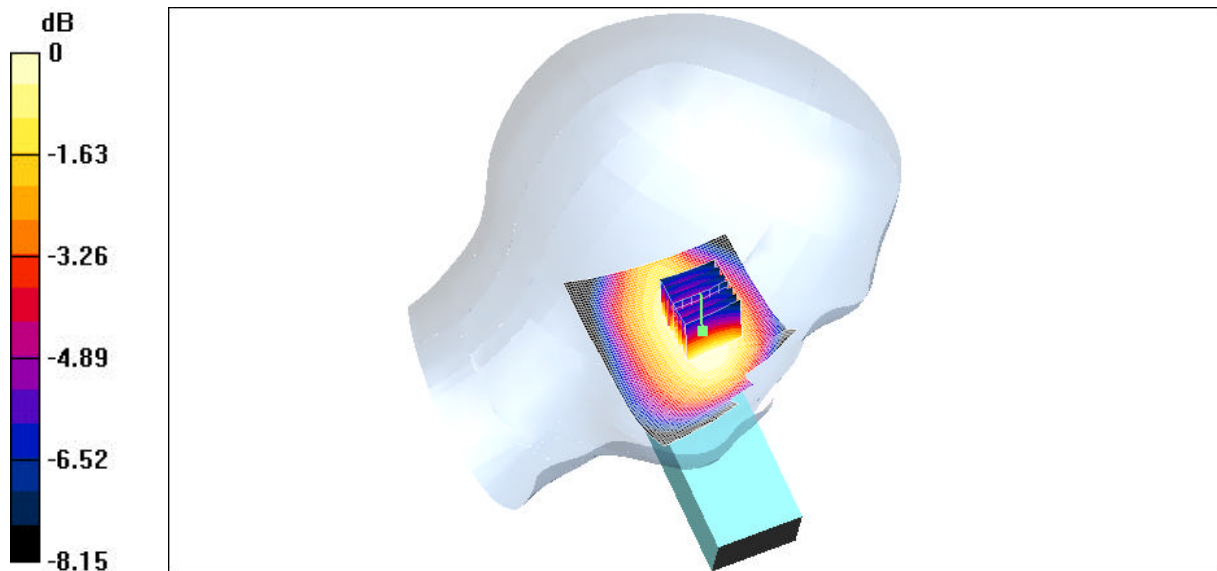
CDMA 363 Left Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.1 V/m; Power Drift = 0.004 dB

Maximum value of SAR (measured) = 0.360 mW/g

Peak SAR (extrapolated) = 0.435 W/kg

SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.261 mW/g



0 dB = 0.360mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 1013

Communication System: CDMA;Frequency: 824.7 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 05/24/2004;Ambient Temp: 22.2 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 1013 Right Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.030 mW/g

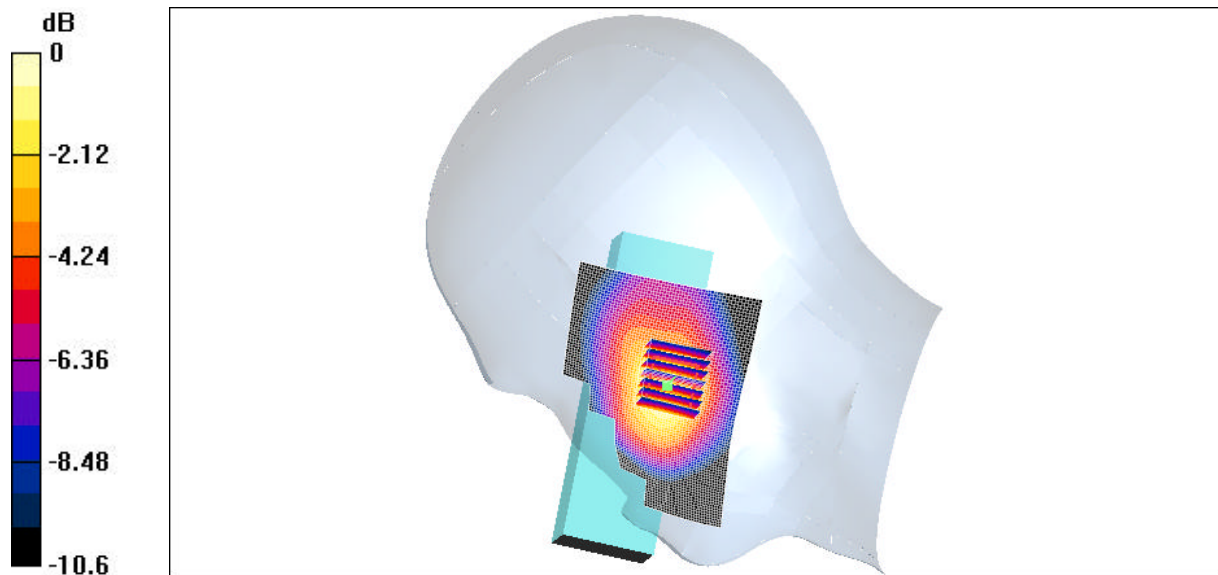
CDMA 1013 Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,
dz=5mm

Reference Value = 15 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.04 mW/g

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.95 mW/g; SAR(10 g) = 0.598 mW/g



0 dB = 1.04mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Right Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.36 mW/g

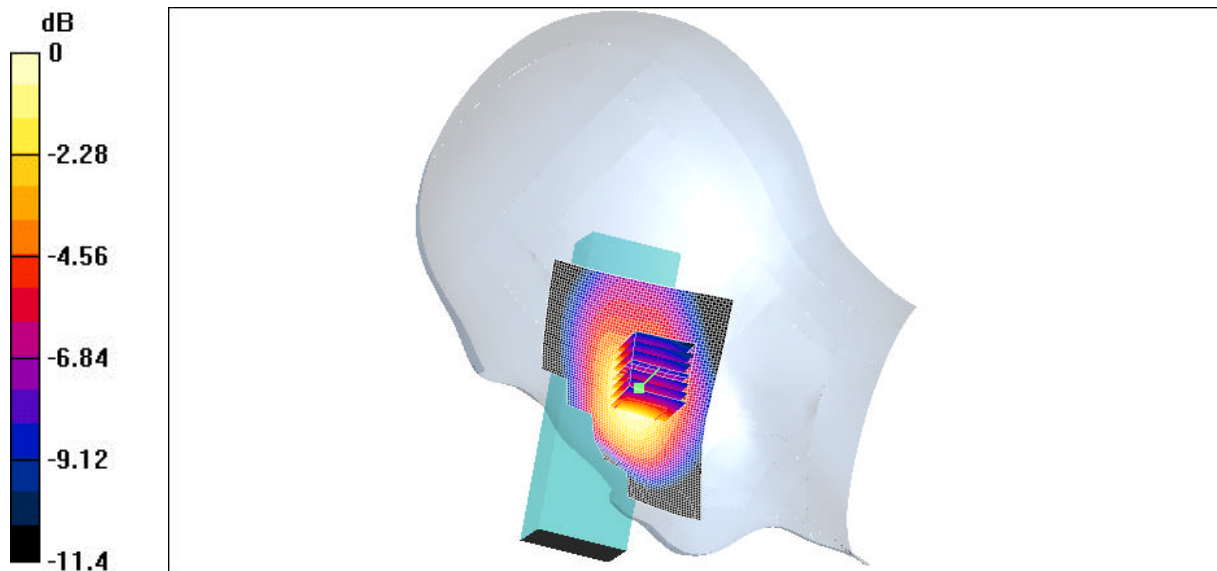
CDMA 363 Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.3 mW/g

Peak SAR (extrapolated) = 2 W/kg

SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.794 mW/g



0 dB = 1.3mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5230;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5230;CDMA Mode Ch: 777

Communication System: CDMA;Frequency: 848.31 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 777 Right Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.22 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.18 mW/g

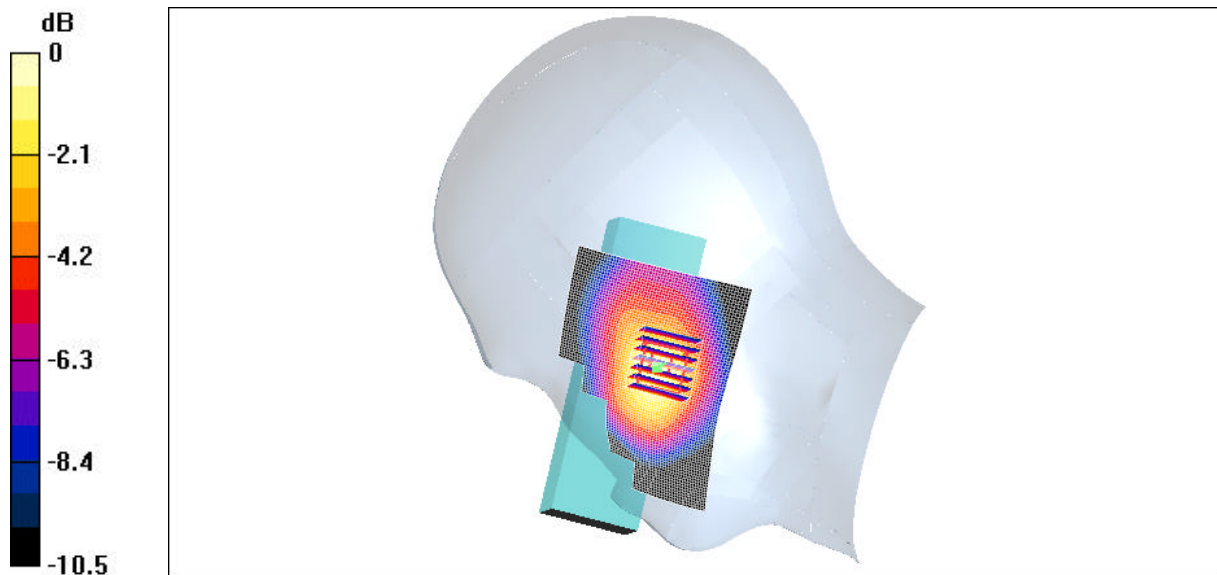
CDMA 777 Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.22 V/m; Power Drift = -0.1 dB

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

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 1.10 mW/g; SAR(10 g) = 0.675 mW/g



0 dB = 1.19mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 05/24/2004;Ambient Temp: 22.2 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Right Head Tilt/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 18 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.344 mW/g

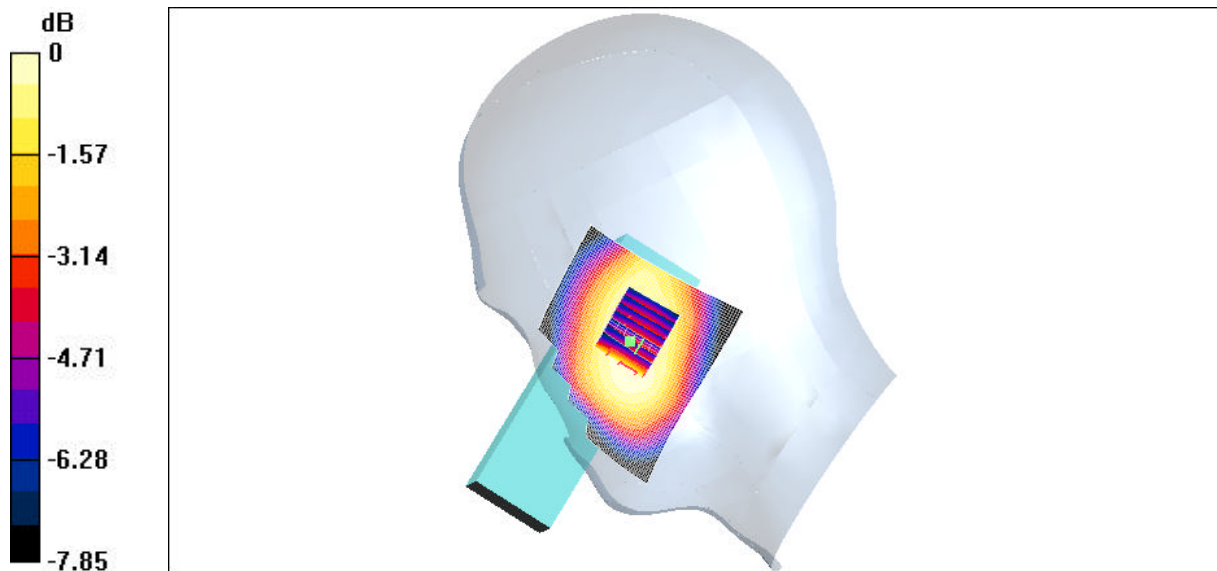
CDMA 363 Right Head Tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.342 mW/g

Peak SAR (extrapolated) = 0.408 W/kg

SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.247 mW/g



0 dB = 0.342mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 777

Communication System: CDMA;Frequency: 824.7 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.97$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 05/25/2004;Ambient Temp: 22.3 °C;Tissue Temp: 21.8 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 1013 Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 26.2 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 0.681 mW/g

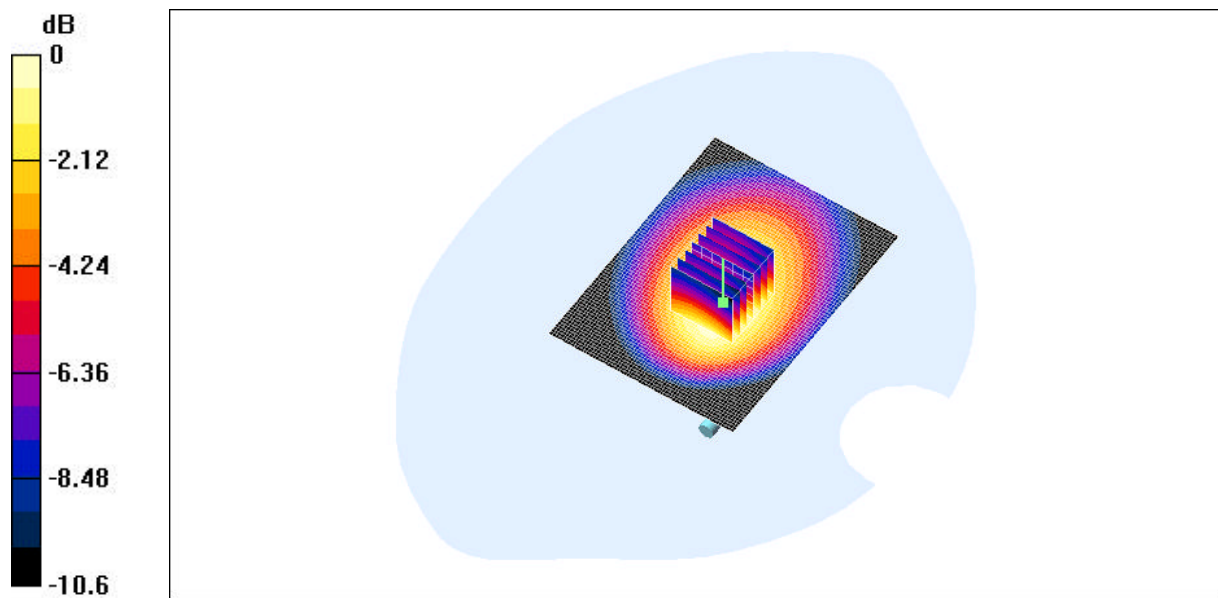
CDMA 1013 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.2 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 0.677 mW/g

Peak SAR (extrapolated) = 0.873 W/kg

SAR(1 g) = 0.64 mW/g; SAR(10 g) = 0.432 mW/g



0 dB = 0.677mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.97$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 05/25/2004;Ambient Temp: 22.4°C;Tissue Temp: 21.9°C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.01 mW/g

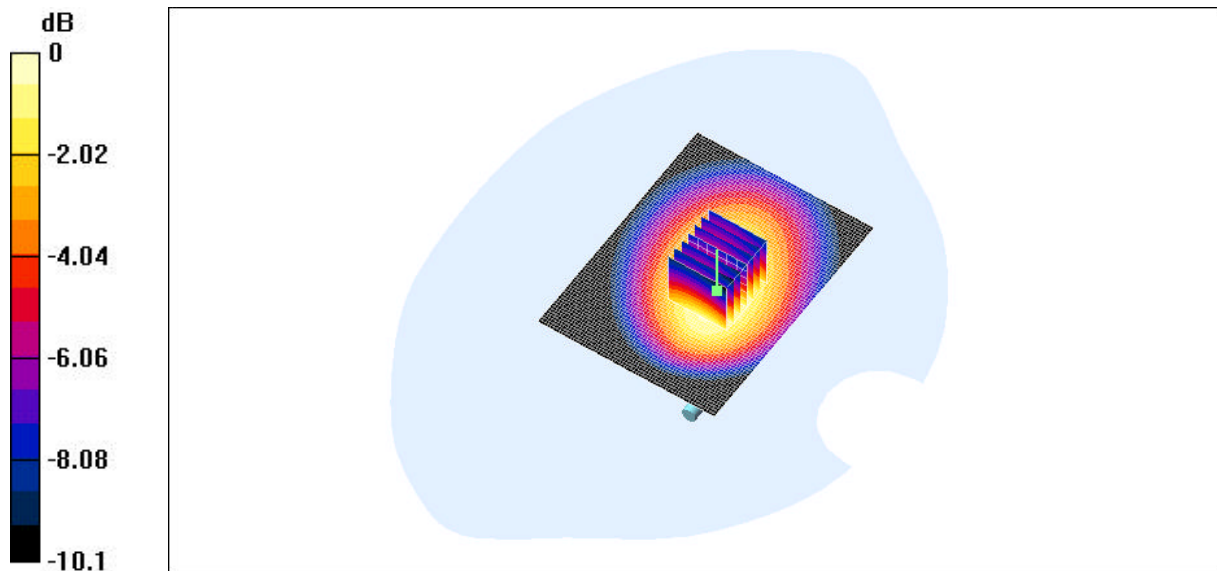
CDMA 363 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.01 mW/g

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.667 mW/g



0 dB = 1.01mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 777

Communication System: CDMA;Frequency: 848.31 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.97$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 05/25/2004;Ambient Temp: 22.4 °C;Tissue Temp: 21.8 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 777 Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 27.1 V/m; Power Drift = -0.0 dB

Maximum value of SAR (interpolated) = 0.824 mW/g

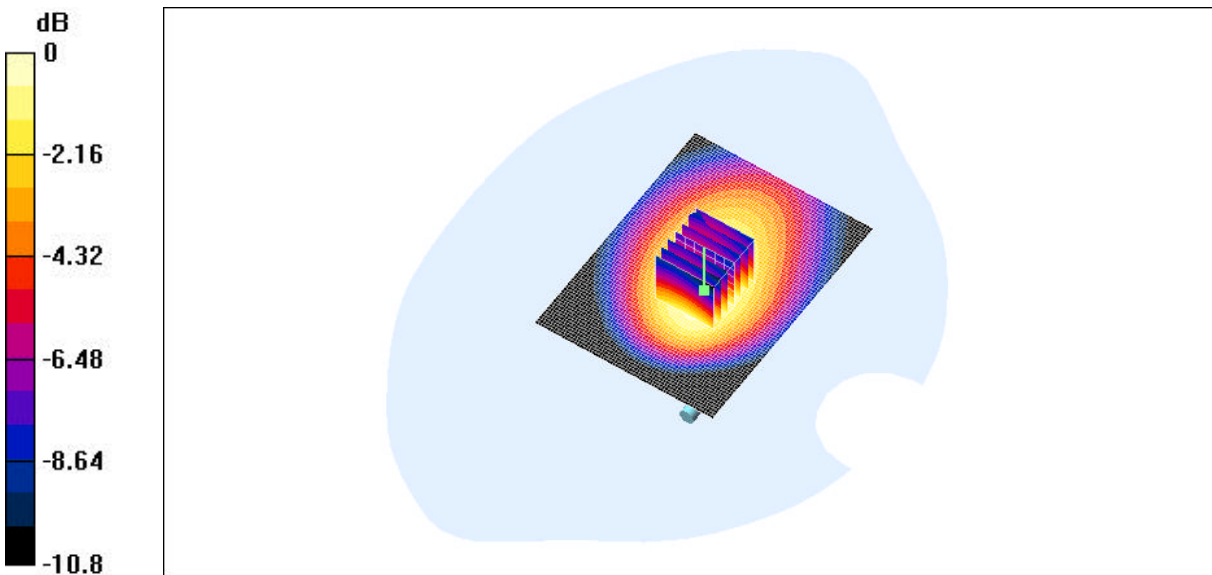
CDMA 777 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.1 V/m; Power Drift = -0.0 dB

Maximum value of SAR (measured) = 0.821 mW/g

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.790 mW/g; SAR(10 g) = 0.513 mW/g



0 dB = 0.821mW/g

Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.89$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³)

Phantom section: Right Section

Test Date: 05/24/2004;Ambient Temp: 22.1 °C;Tissue Temp: 21.7 °C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Right Head Touch/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.36 mW/g

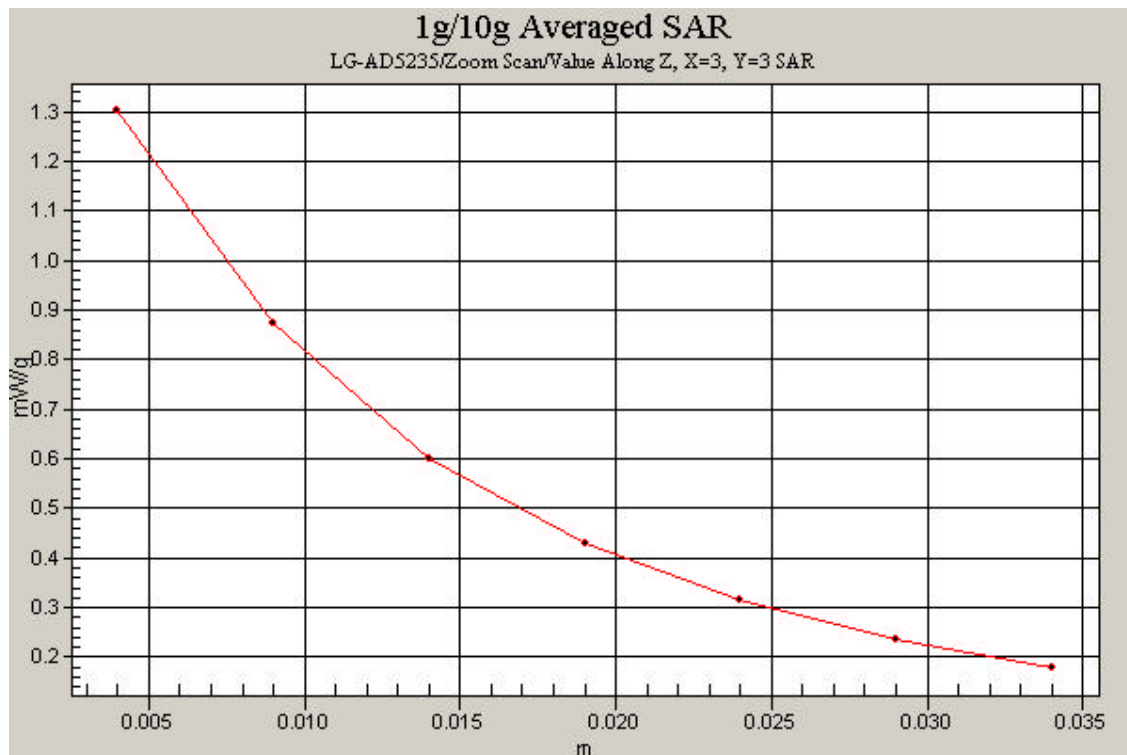
CDMA 363 Right Head Touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.7 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.3 mW/g

Peak SAR (extrapolated) = 2 W/kg

SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.794 mW/g



Test Laboratory: LG Electronics Inc.

DUT: LG-AD5235;Type: Single Band-Single Mode;Serial: #1

Program Name: LG-AD5235;CDMA Mode Ch: 363

Communication System: CDMA;Frequency: 835.89 MHz;Duty Cycle: 1:1

Medium: Head 835 MHz;($\sigma = 0.97$ mho/m; $\epsilon_r = 55.2$; $\rho = 1000$ kg/m³)

Phantom section: Flat Section

Test Date: 05/25/2004;Ambient Temp: 22.4°C;Tissue Temp: 21.9°C

Probe: ET3DV6 - SN1730;ConvF(6.2, 6.2, 6.2);Calibrated: 2003-12-16

Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)

Electronics: DAE3 Sn534;Calibrated: 2003-12-23

Phantom: SAM 835;Type: SAM 4.0;Serial: TP-1151

Measurement SW: DASY4, V4.2 Build 44;Postprocessing SW: SEMCAD, V1.8 Build 112

CDMA 363 Body/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 1.01 mW/g

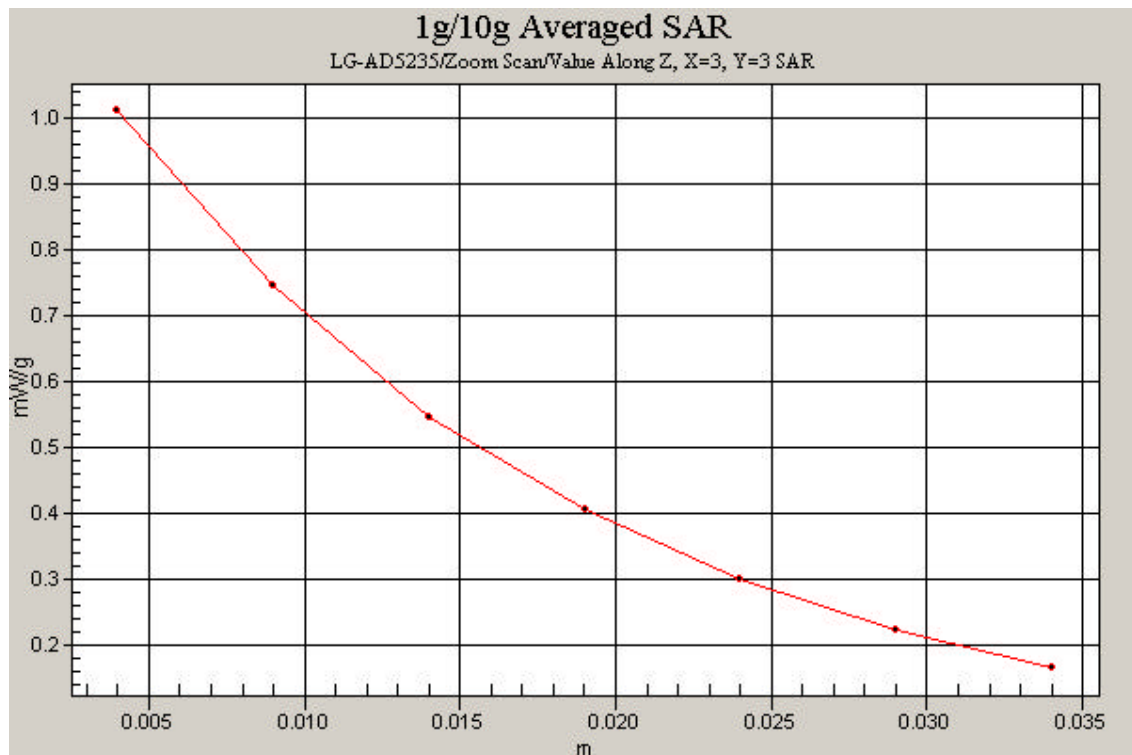
CDMA 363 Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.4 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 1.01 mW/g

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.667 mW/g



APPENDIX D : Calibration Certificates

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

Client **LG (Dymstec)**

CALIBRATION CERTIFICATE

Object(s) **ET3DV6 - SN:1730**

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

Calibration date: **December 16, 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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	QB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Reference 20 dB Attenuator	SN: 5086 (20b)	3-Apr-03 (METAS No. 251-0340)	Apr-04
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8461A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

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

Date issued: December 16, 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.

Schmid & Partner Engineering AG

s p e a gZeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, <http://www.speag.com>

Probe ET3DV6

SN:1730

Manufactured:	October 1, 2002
Last calibration:	November 20, 2002
Recalibrated:	December 16, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1730

December 16, 2003

DASY - Parameters of Probe: ET3DV6 SN:1730

Sensitivity in Free Space

NormX	1.37 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.59 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.75 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	94	mV
DCP Y	94	mV
DCP Z	94	mV

Sensitivity in Tissue Simulating Liquid

Head **900 MHz** $\epsilon_r = 41.5 \pm 5\%$ $\sigma = 0.97 \pm 5\% \text{ mho/m}$
Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	6.2 $\pm 9.5\%$ (k=2)	Boundary effect:
ConvF Y	6.2 $\pm 9.5\%$ (k=2)	Alpha 0.29
ConvF Z	6.2 $\pm 9.5\%$ (k=2)	Depth 2.87

Head **1800 MHz** $\epsilon_r = 40.0 \pm 5\%$ $\sigma = 1.40 \pm 5\% \text{ mho/m}$
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.1 $\pm 9.5\%$ (k=2)	Boundary effect:
ConvF Y	5.1 $\pm 9.5\%$ (k=2)	Alpha 0.44
ConvF Z	5.1 $\pm 9.5\%$ (k=2)	Depth 2.68

Boundary Effect

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

Probe Tip to Boundary	1 mm	2 mm
SAR _{pe} [%] Without Correction Algorithm	9.2	5.5
SAR _{pe} [%] With Correction Algorithm	0.4	0.5

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

Probe Tip to Boundary	1 mm	2 mm
SAR _{pe} [%] Without Correction Algorithm	12.3	8.6
SAR _{pe} [%] With Correction Algorithm	0.2	0.3

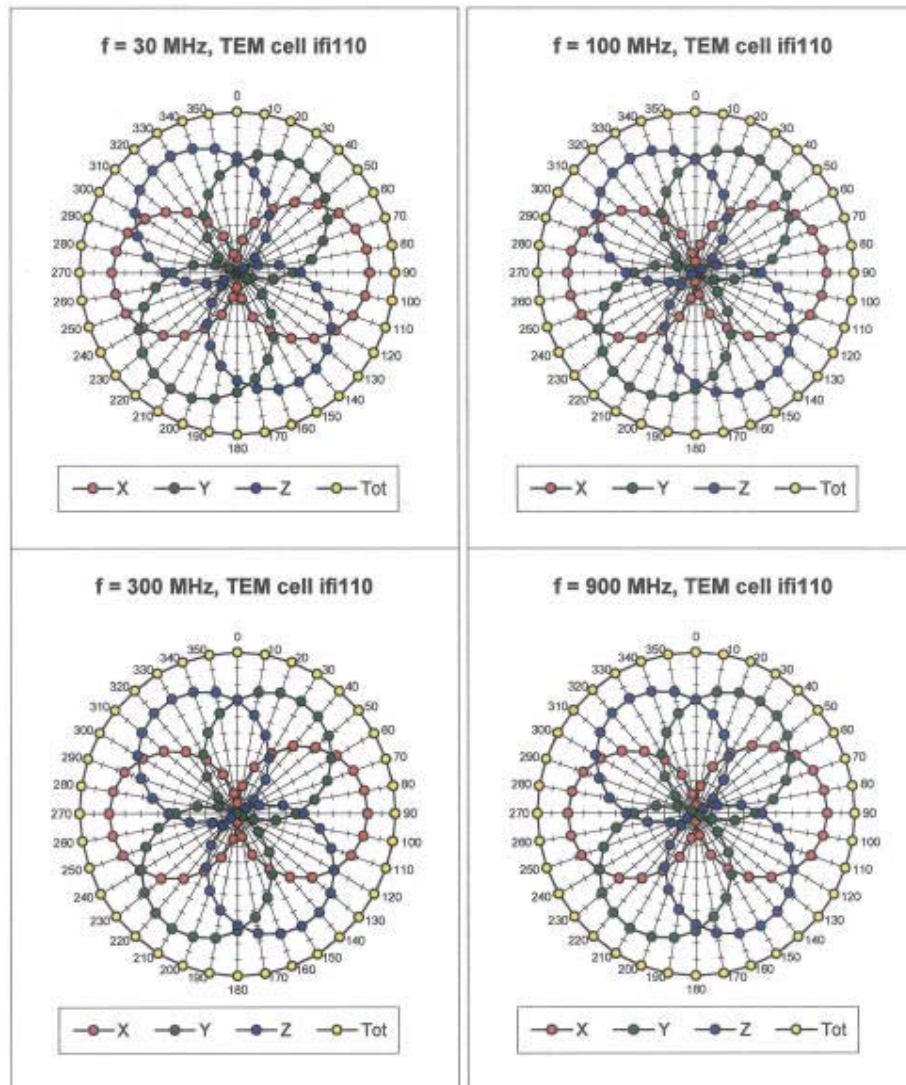
Sensor Offset

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

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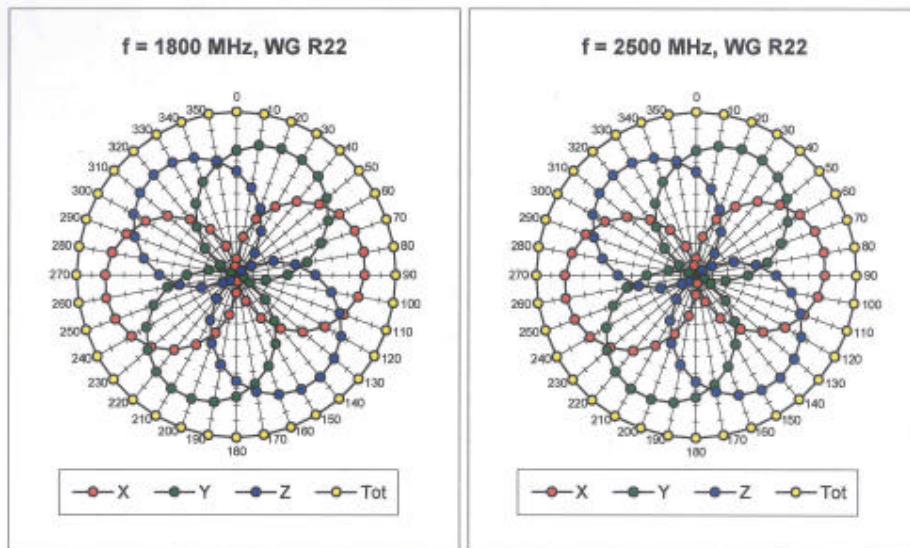
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Receiving Pattern (ϕ , $\theta = 0^\circ$)

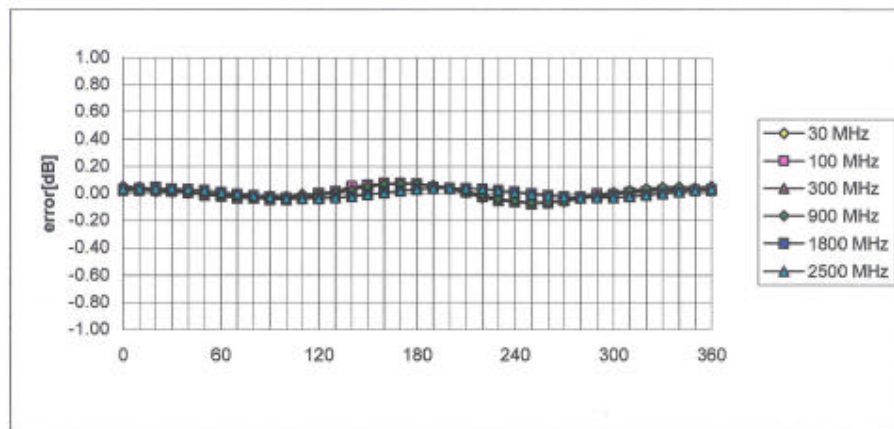


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Isotropy Error (ϕ), $\theta = 0^\circ$

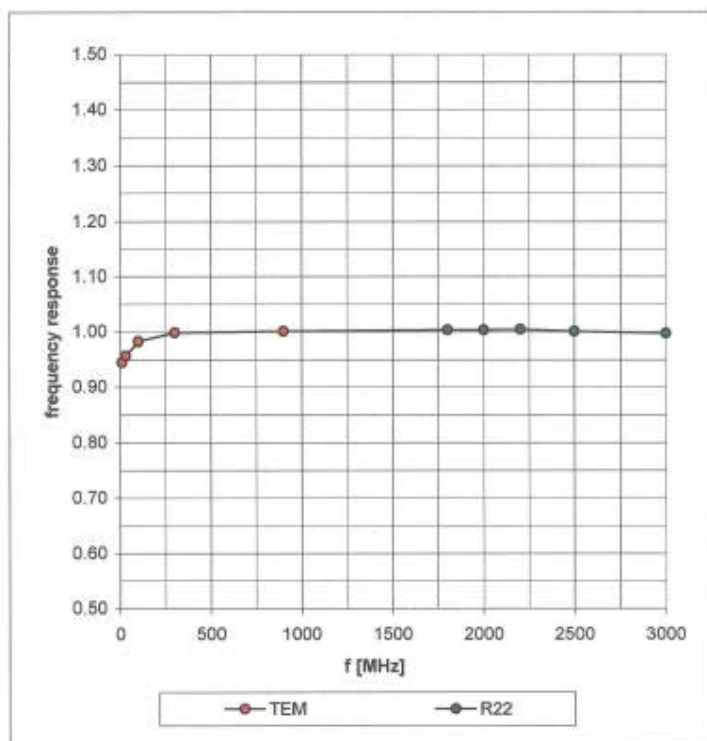


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Frequency Response of E-Field

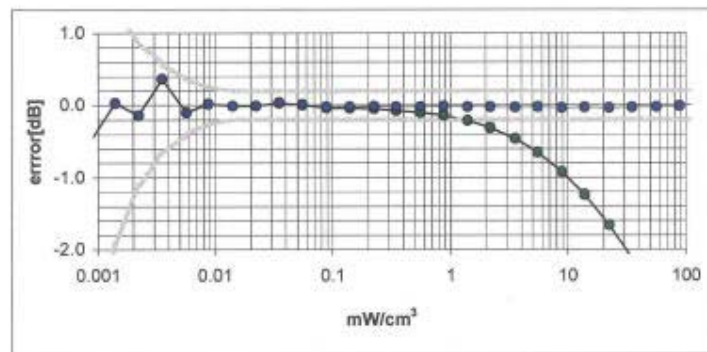
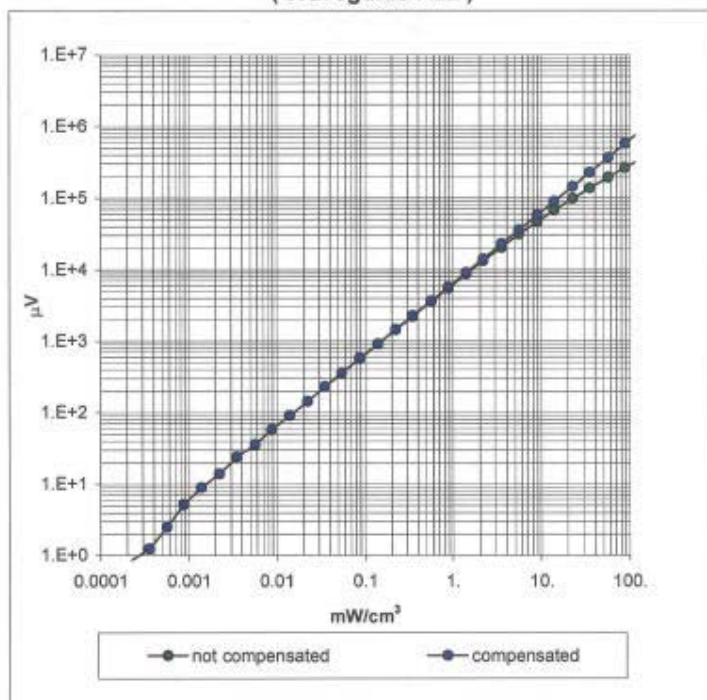
(TEM-Cell:ifi110, Waveguide R22)



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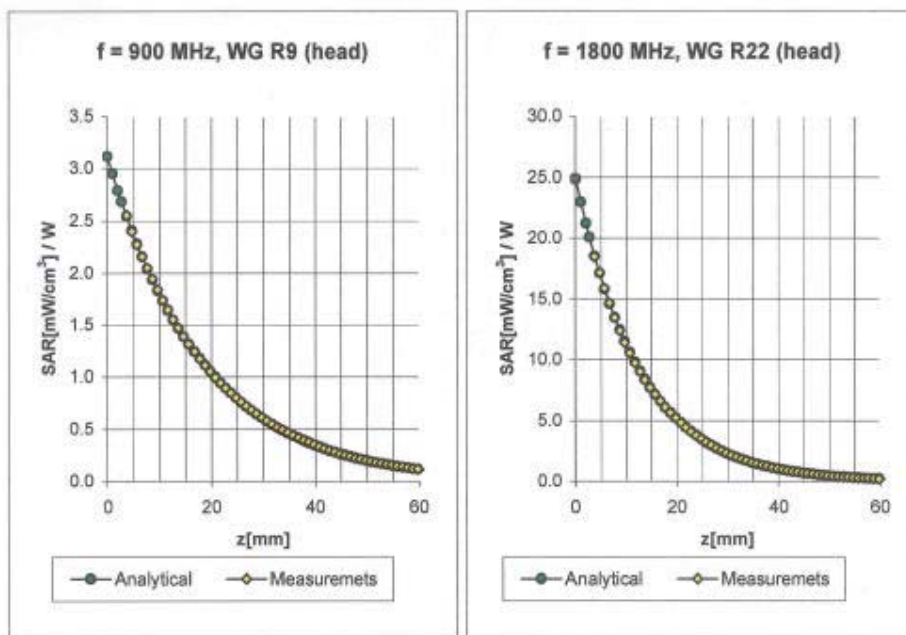
Dynamic Range f(SAR_{brain}) (Waveguide R22)



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Conversion Factor Assessment

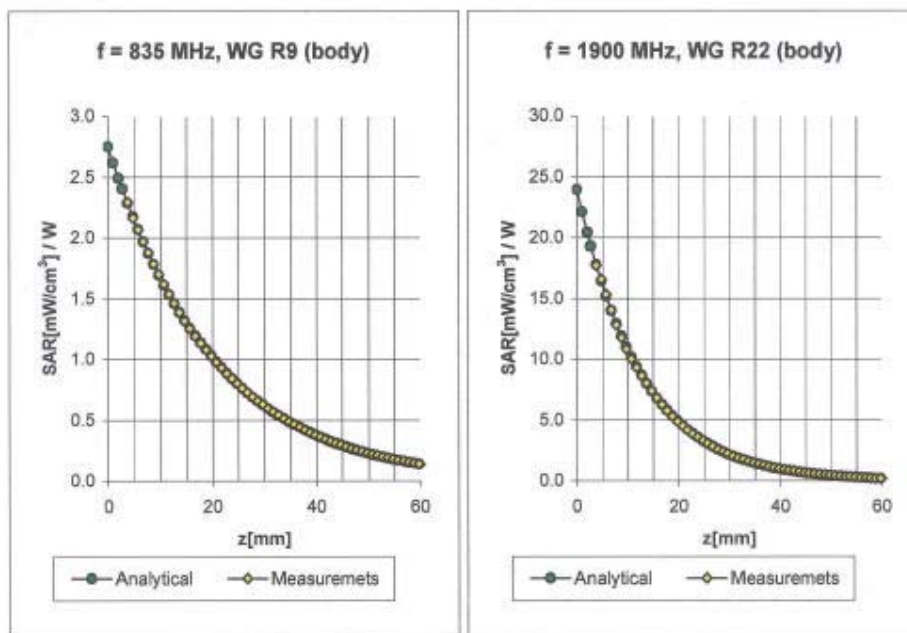


Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X			
ConvF X	6.2 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.2 $\pm 9.5\%$ (k=2)	Alpha	0.29
ConvF Z	6.2 $\pm 9.5\%$ (k=2)	Depth	2.87
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\% \text{ mho/m}$
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X			
ConvF X	5.1 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	5.1 $\pm 9.5\%$ (k=2)	Alpha	0.44
ConvF Z	5.1 $\pm 9.5\%$ (k=2)	Depth	2.68

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Conversion Factor Assessment



Body 835 MHz $\epsilon_r = 55.2 \pm 5\%$ $\sigma = 0.97 \pm 5\%$ mho/m

Valid for f=750-950 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	6.2 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	6.2 $\pm 9.5\%$ (k=2)	Alpha	0.35
ConvF Z	6.2 $\pm 9.5\%$ (k=2)	Depth	2.52

Body 1900 MHz $\epsilon_r = 53.3 \pm 5\%$ $\sigma = 1.52 \pm 5\%$ mho/m

Valid for f=1800-2000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

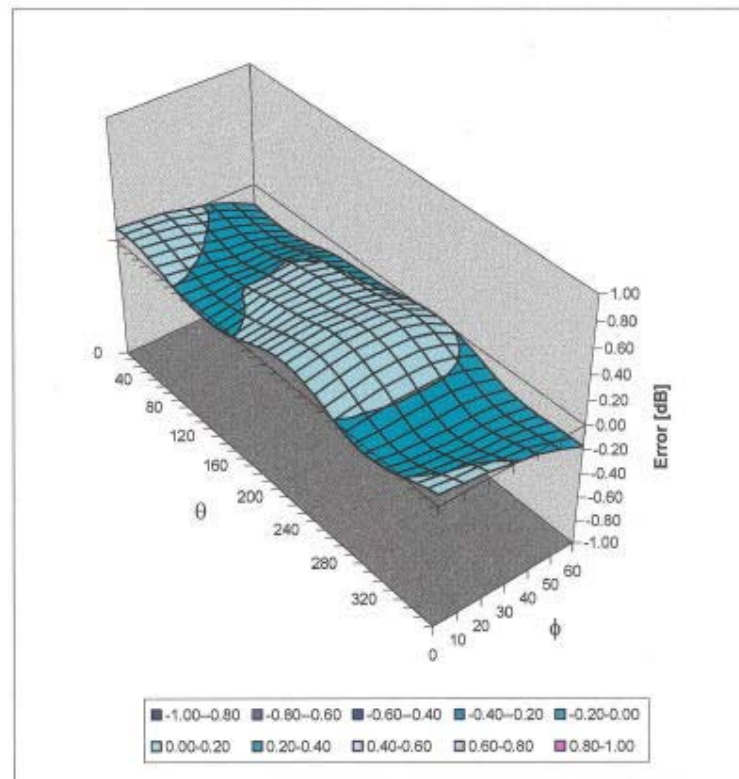
ConvF X	4.4 $\pm 9.5\%$ (k=2)	Boundary effect:	
ConvF Y	4.4 $\pm 9.5\%$ (k=2)	Alpha	0.62
ConvF Z	4.4 $\pm 9.5\%$ (k=2)	Depth	2.57

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Deviation from Isotropy in HSL

Error ($\theta\phi$), $f = 900$ MHz



Schmid & Partner Engineering AG

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

Calibration Certificate

835 MHz System Validation Dipole

Type:

D835V2

Serial Number:

471

Place of Calibration:

Zurich

Date of Calibration:

December 4, 2002

Calibration Interval:

24 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:

D. Vetter

Approved by:

Marie Katze

**Schmid & Partner
Engineering AG**

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

DASY

Dipole Validation Kit

Type: D835V2

Serial: 471

Manufactured: November 15, 2002

Calibrated: December 4, 2002

1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with head simulating solution of the following electrical parameters at 835 MHz:

Relative Dielectricity	43.1	$\pm 5\%$
Conductivity	0.90 mho/m	$\pm 5\%$

The DASY System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.6 at 835 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole center to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

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

The dipole input power (forward power) was $250\text{mW} \pm 3\%$. 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 ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	9.76 mW/g
averaged over 10 cm^3 (10 g) of tissue:	6.28 mW/g