LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section

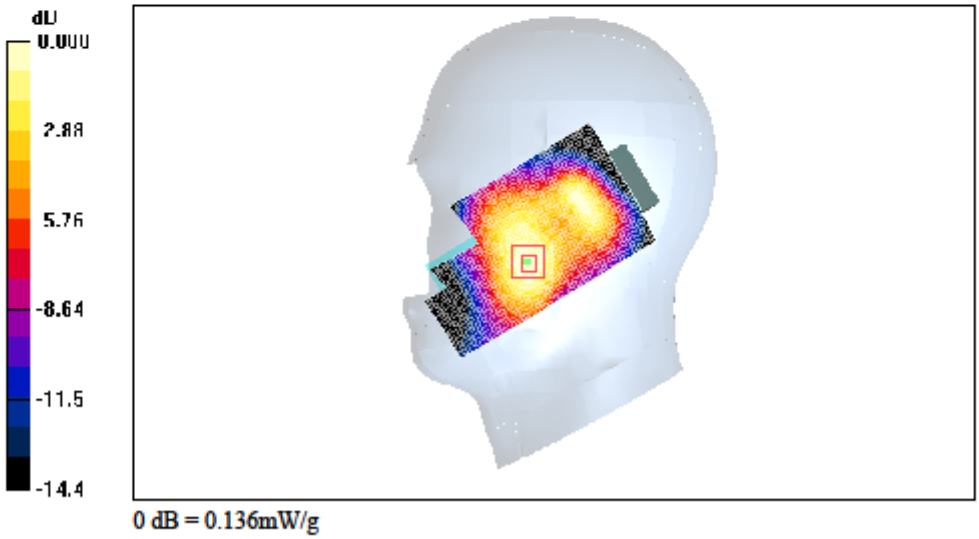
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.66, 4.66, 4.66); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 835MHz; Type: SAM; Serial: TP-1066
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Tilt,CH661, Fixed Ant, Standard Battery

PCS1900/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.141 mW/g

PCS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.72 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.169 W/kg
SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.136 mW/g



0 dB = 0.136mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

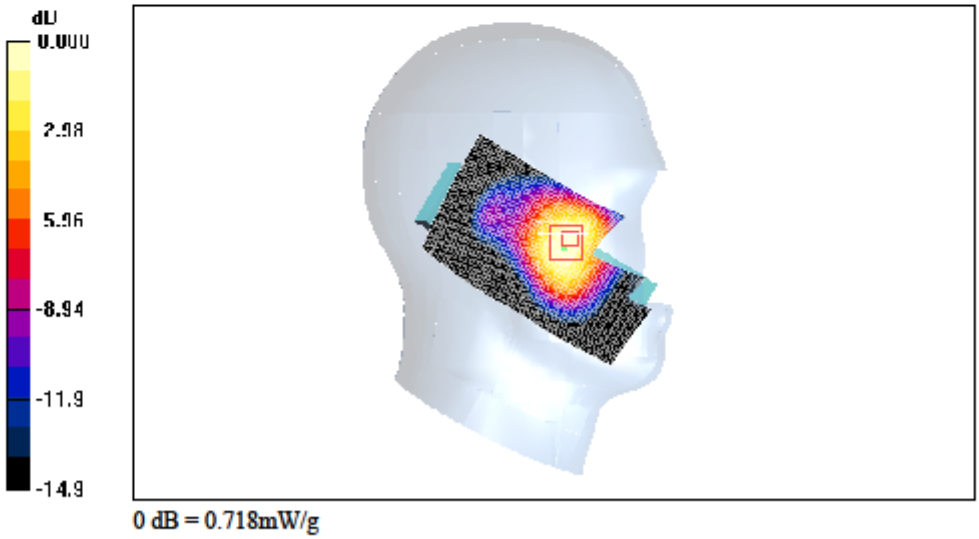
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.66, 4.66, 4.66); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 835MHz; Type: SAM; Serial: TP-1066
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch,CH661, Fixed Ant, Standard Battery

PCS1900/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.753 mW/g

PCS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.67 V/m; Power Drift = 0.315 dB
Peak SAR (extrapolated) = 0.959 W/kg
SAR(1 g) = 0.631 mW/g; SAR(10 g) = 0.389 mW/g
Maximum value of SAR (measured) = 0.718 mW/g



0 dB = 0.718mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section

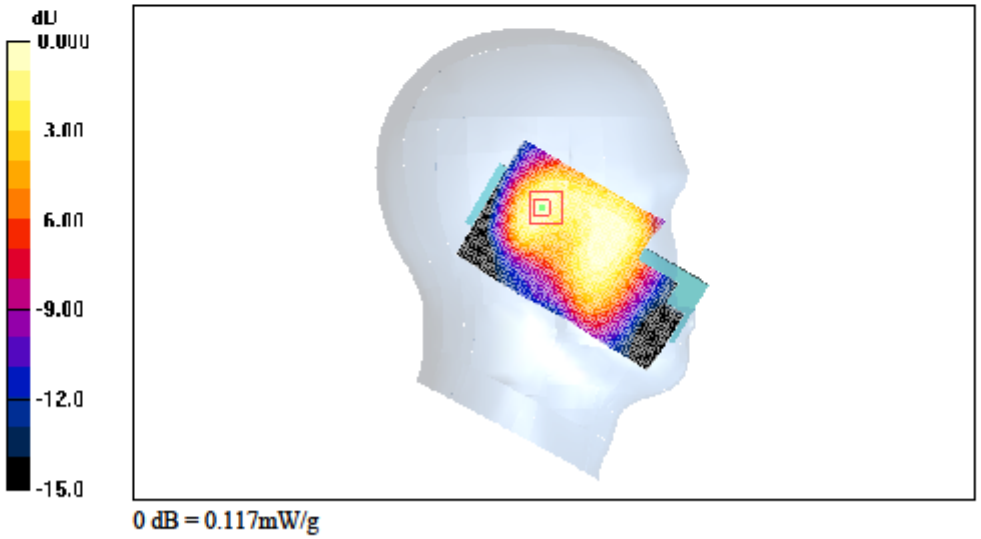
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.66, 4.66, 4.66); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 835MHz; Type: SAM; Serial: TP-1066
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Tilt,CH661, Fixed Ant, Standard Battery

PCS1900/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.124 mW/g

PCS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.63 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.146 W/kg
SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.117 mW/g



0 dB = 0.117mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 837 MHz; σ = 0.95 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

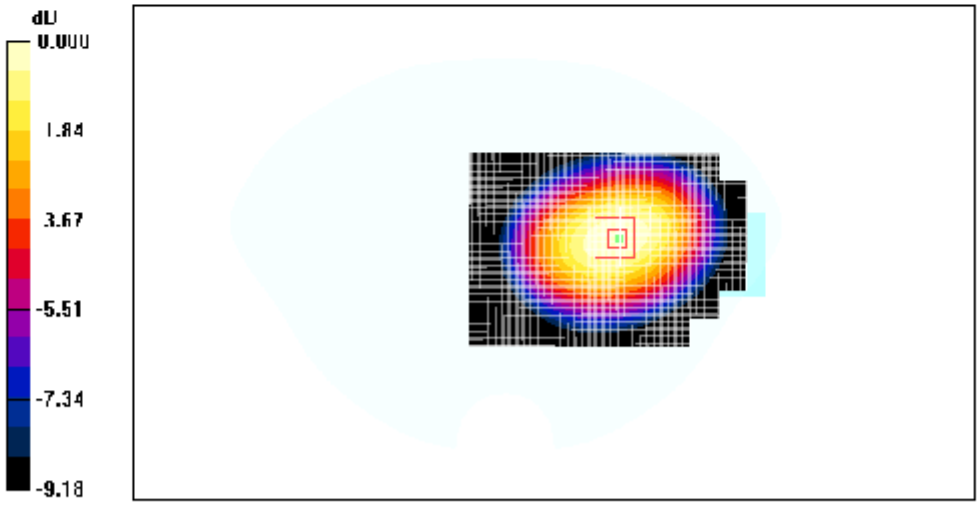
Test Date: 07/06/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(5.55, 5.55, 5.55); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH190, Front, 2TX, Fixed Ant, Standard Battery

GPRS850/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.446 mW/g

GPRS850/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.46 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.525 W/kg
SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.287 mW/g
Maximum value of SAR (measured) = 0.445 mW/g



0 dB = 0.445mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 837 MHz; σ = 0.95 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

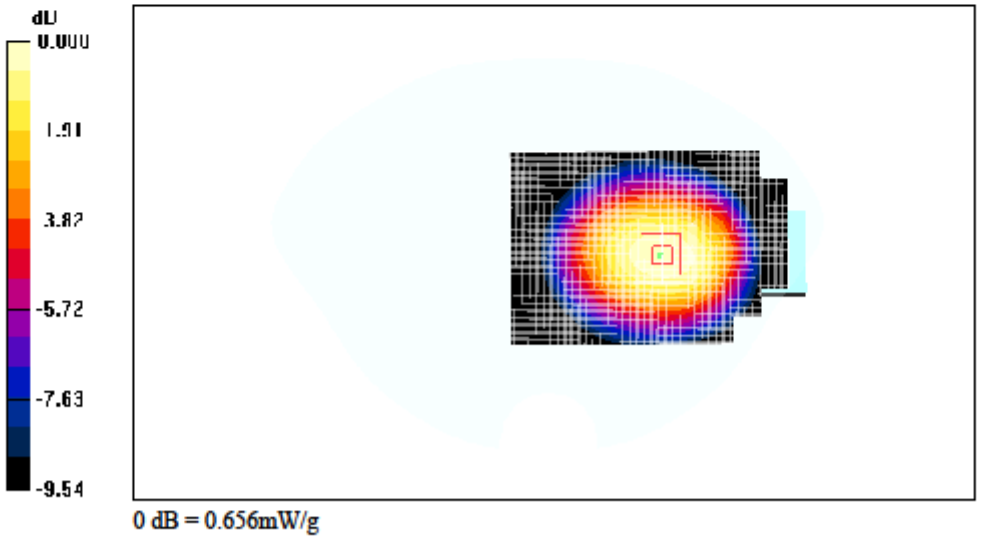
Test Date: 07/06/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(5.55, 5.55, 5.55); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH190, Rear, 2TX, Fixed Ant, Standard Battery

GPRS850/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.661 mW/g

GPRS850/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.106 dB
Peak SAR (extrapolated) = 0.777 W/kg
SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.656 mW/g



0 dB = 0.656mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.95 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

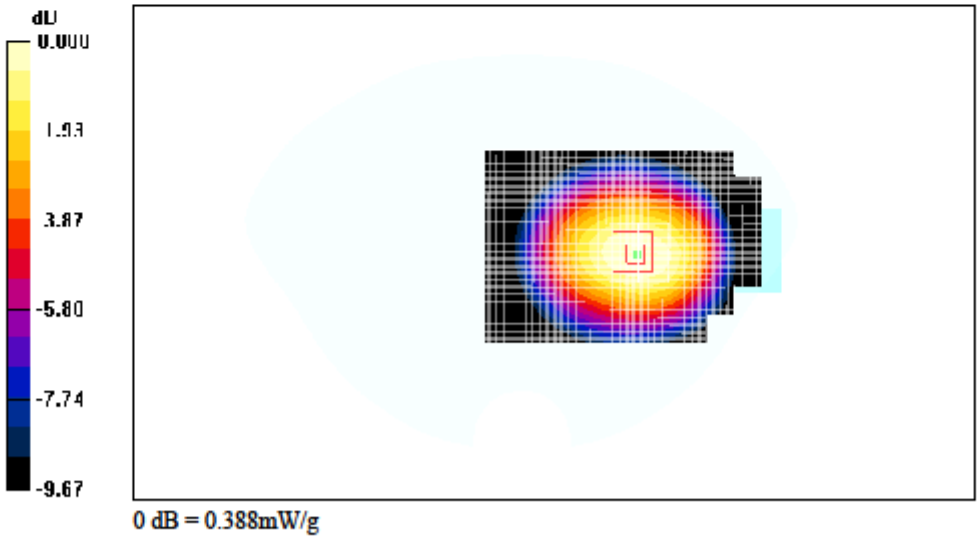
Test Date: 07/06/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(5.55, 5.55, 5.55); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH190, Rear, 1TX, Fixed Ant, Standard Battery

GPRS850/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.397 mW/g

GPRS850/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.26 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.459 W/kg
SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.254 mW/g
Maximum value of SAR (measured) = 0.388 mW/g



0 dB = 0.388mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

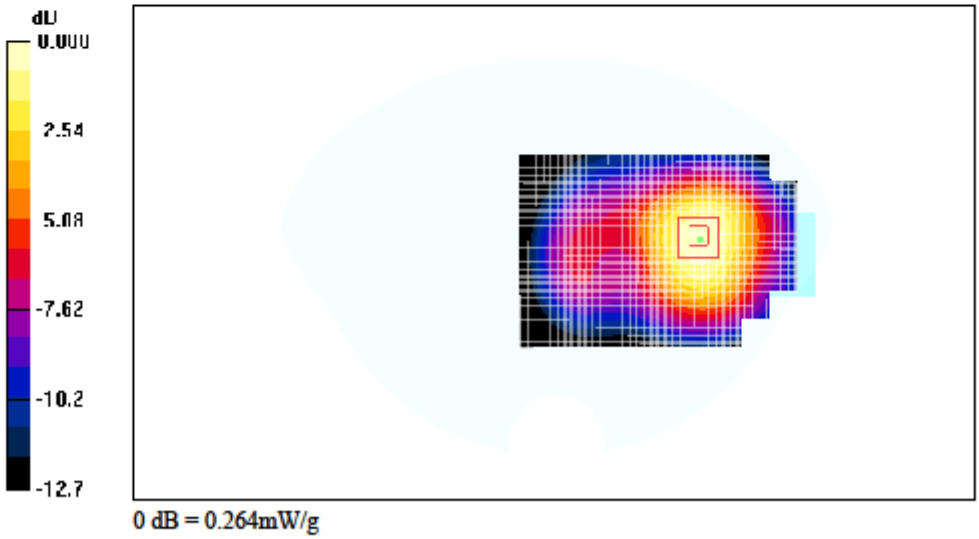
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.2, 4.2, 4.2); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH661, Front, 2TX, Fixed Ant, Standard Battery

GPRS1900/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.267 mW/g

GPRS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.57 V/m; Power Drift = -0.064 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.146 mW/g
Maximum value of SAR (measured) = 0.264 mW/g



0 dB = 0.264mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

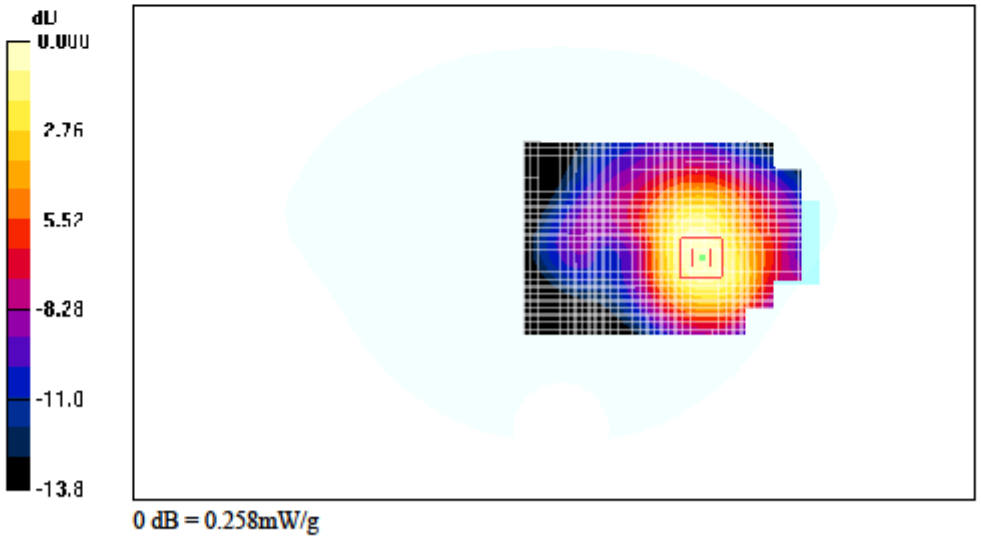
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.2, 4.2, 4.2); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH661, Rear, 2TX, Fixed Ant, Standard Battery

GPRS1900/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.260 mW/g

GPRS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.45 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 0.321 W/kg
SAR(1 g) = 0.222 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.258 mW/g



0 dB = 0.258mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

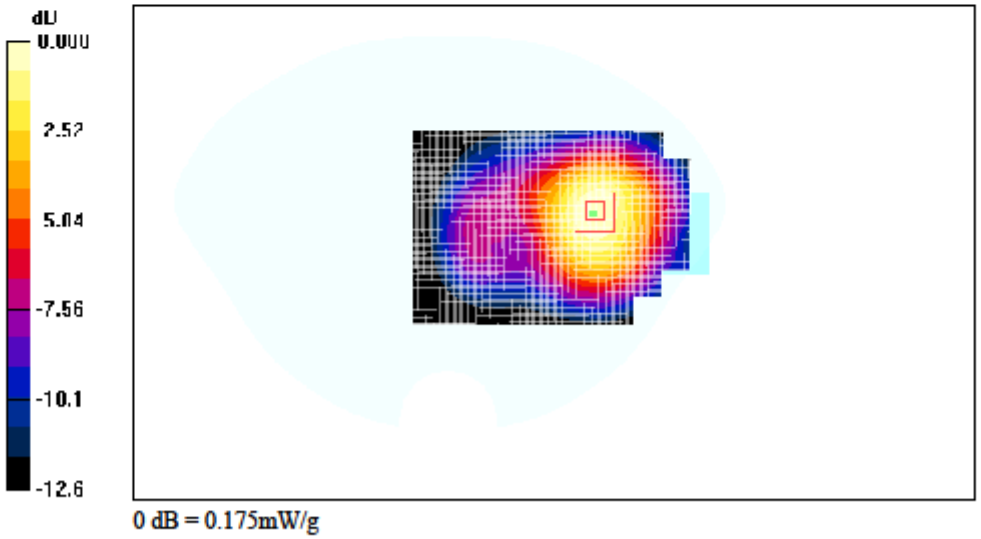
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.2, 4.2, 4.2); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH661, Front, 1TX, Fixed Ant, Standard Battery

GPRS1900/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.176 mW/g

GPRS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.03 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.097 mW/g
Maximum value of SAR (measured) = 0.175 mW/g



0 dB = 0.175mW/g

LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 837 MHz; σ = 0.901 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3
Phantom section: Left Section

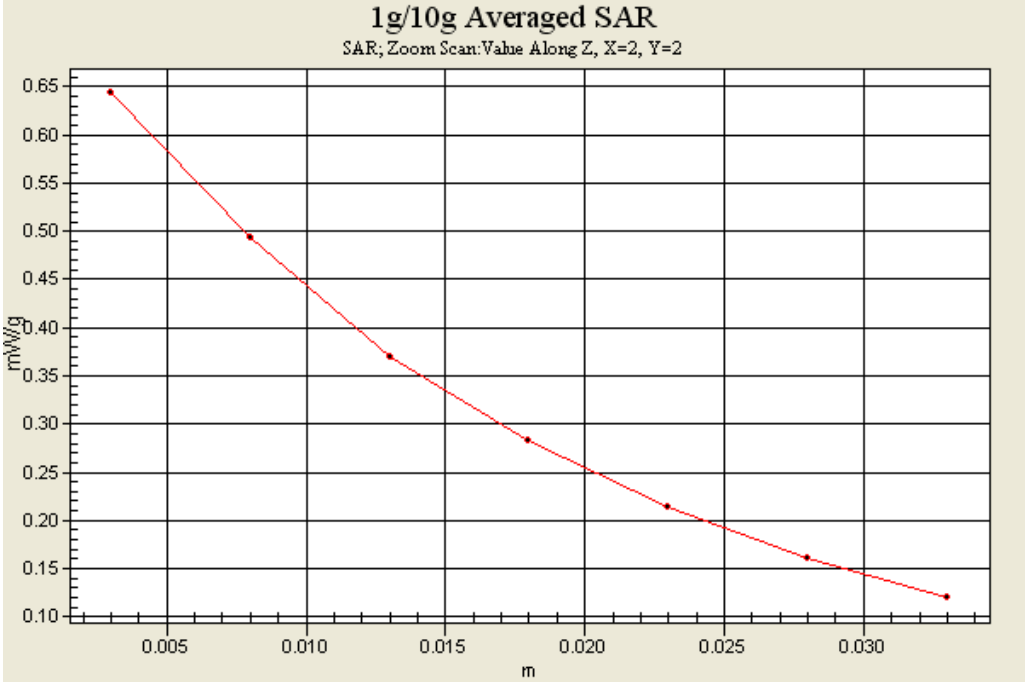
Test Date: 07/06/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(5.68, 5.68, 5.68); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 835MHz; Type: SAM; Serial: TP-1066
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Left Head Touch,CH190, Fixed Ant, Standard Battery

GSM850/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.663 mW/g

GSM850/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.01 V/m; Power Drift = -0.202 dB
Peak SAR (extrapolated) = 0.760 W/kg
SAR(1 g) = 0.576 mW/g; SAR(10 g) = 0.407 mW/g
Maximum value of SAR (measured) = 0.643 mW/g



LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section

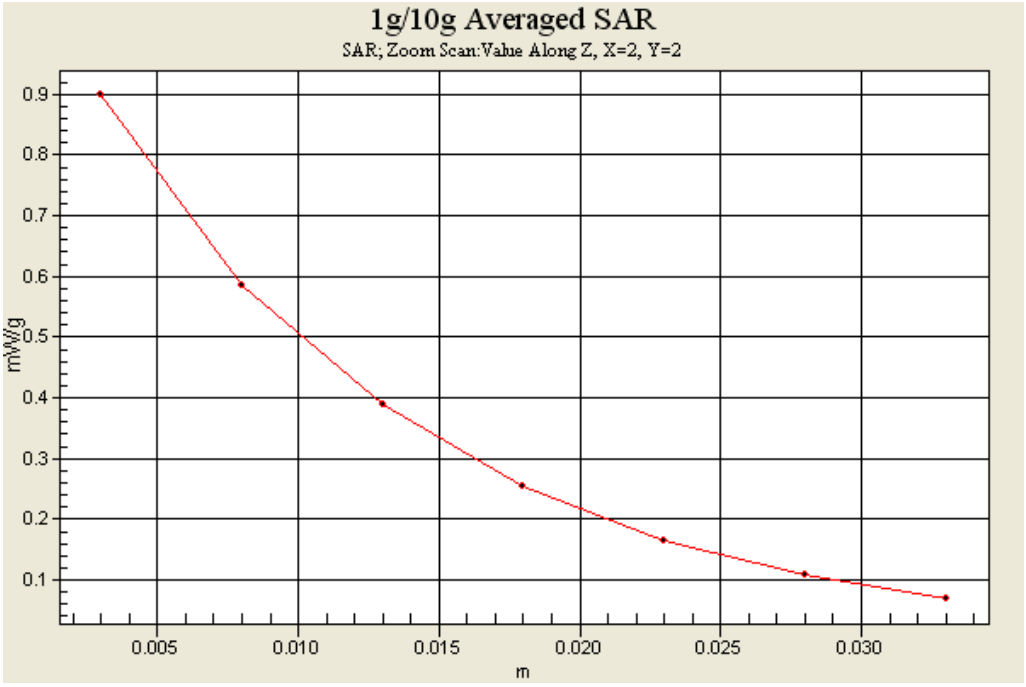
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.66, 4.66, 4.66); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 835MHz; Type: SAM; Serial: TP-1066
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Right Head Touch,CH661, Fixed Ant, Standard Battery

PCS1900/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.913 mW/g

PCS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.82 V/m; Power Drift = 0.219 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.898 mW/g



LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 837 MHz; σ = 0.95 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

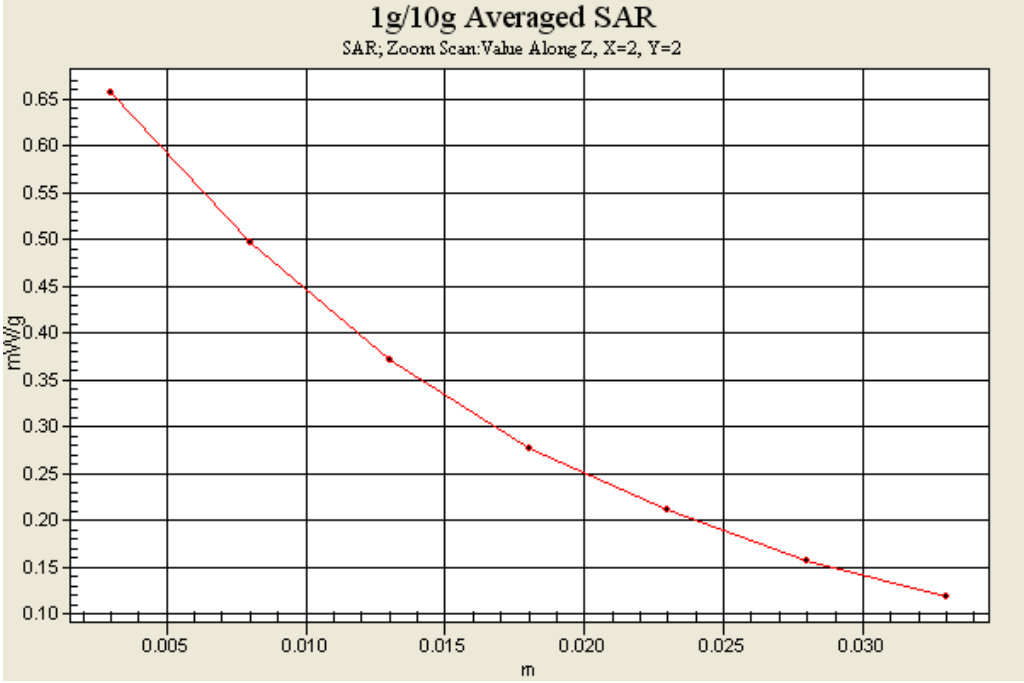
Test Date: 07/06/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(5.55, 5.55, 5.55); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH190, Rear, 2TX, Fixed Ant, Standard Battery

GPRS850/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.661 mW/g

GPRS850/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.106 dB
Peak SAR (extrapolated) = 0.777 W/kg
SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.424 mW/g
Maximum value of SAR (measured) = 0.656 mW/g



LG Electronics Inc.

DUT: LG-A165; Type: Cellular/PCS GSM Phone with Bluetooth; Serial: #1

Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

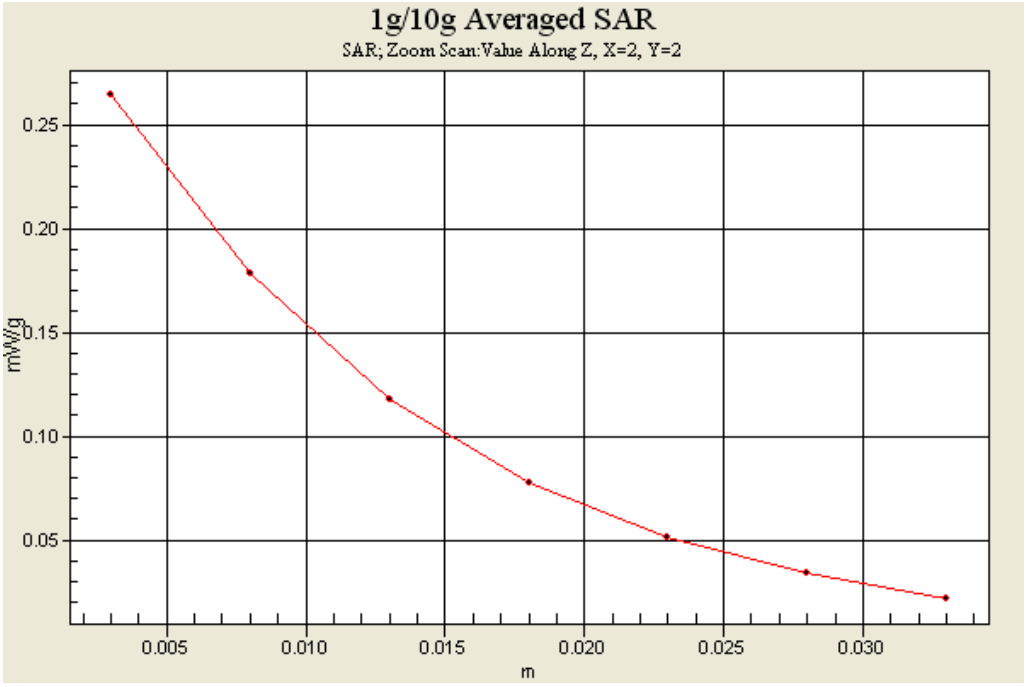
Test Date: 07/05/2010;Ambient Temp: 22.0°C;Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3066; ConvF(4.2, 4.2, 4.2); Calibrated: 2010-02-24
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE3 Sn362; Calibrated: 2010-04-30
Phantom: SAM with CRP 1800MHz; Type: SAM; Serial: TP-1244
Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Flat Touch ,CH661, Front, 2TX, Fixed Ant, Standard Battery

GPRS1900/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.267 mW/g

GPRS1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.57 V/m; Power Drift = -0.064 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.146 mW/g
Maximum value of SAR (measured) = 0.264 mW/g



APPENDIX C: Calibration Certificates

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 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 Accreditation Service (SAS)
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 LG (Dymstec)

Certificate No: ES3-3066_Feb10

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3066
Calibration procedure(s)	QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	February 24, 2010

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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 24, 2010

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
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
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) 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
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3066

Manufactured:	December 14, 2004
Last calibrated:	February 16, 2009
Recalibrated:	February 24, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3066 February 24, 2010

DASY - Parameters of Probe: ES3DV3 SN:3066

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.22	1.36	1.22	± 10.1%
DCP (mV)[B]	90.7	93.1	91.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

ES3DV3 SN:3066 February 24, 2010

DASY - Parameters of Probe: ES3DV3 SN:3066

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.68	5.68	5.68	0.96	1.04	± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	4.80	4.80	4.80	0.51	1.45	± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.66	4.66	4.66	0.44	1.54	± 11.0%

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV3 SN:3066 February 24, 2010

DASY - Parameters of Probe: ES3DV3 SN:3066

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.55	5.55	5.55	0.72	1.20 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.48	4.48	4.48	0.36	2.07 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.20	4.20	4.20	0.33	2.39 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	3.90	3.90	3.90	0.66	1.27 ± 11.0%

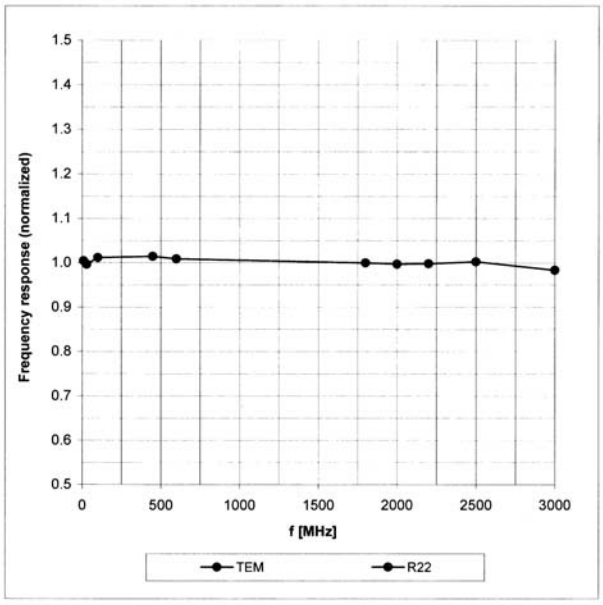
[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Certificate No: ES3-3066_Feb10 Page 6 of 11

ES3DV3 SN:3066 February 24, 2010

Frequency Response of E-Field

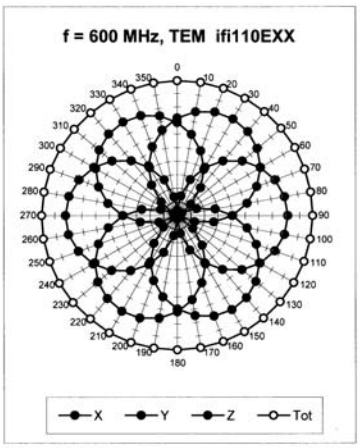
(TEM-Cell:ifi110 EXX, Waveguide: R22)

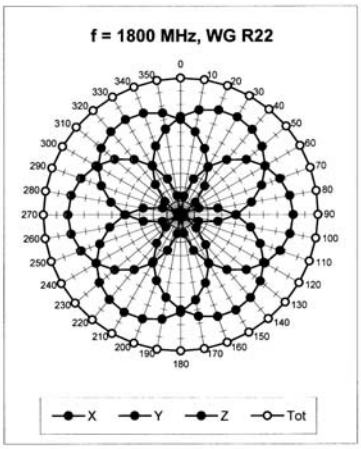


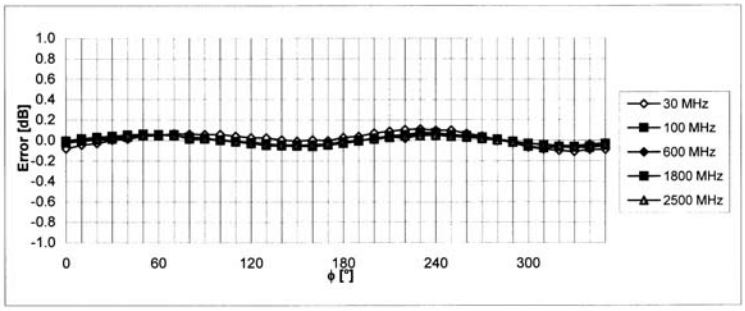
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV3 SN:3066 February 24, 2010

Receiving Pattern (ϕ), ϑ = 0°





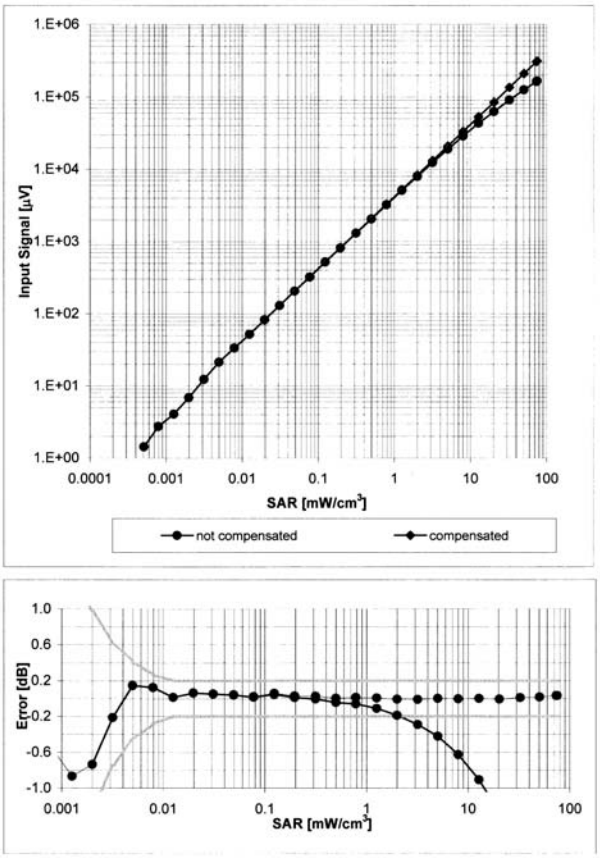


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ES3DV3 SN:3066 February 24, 2010

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)

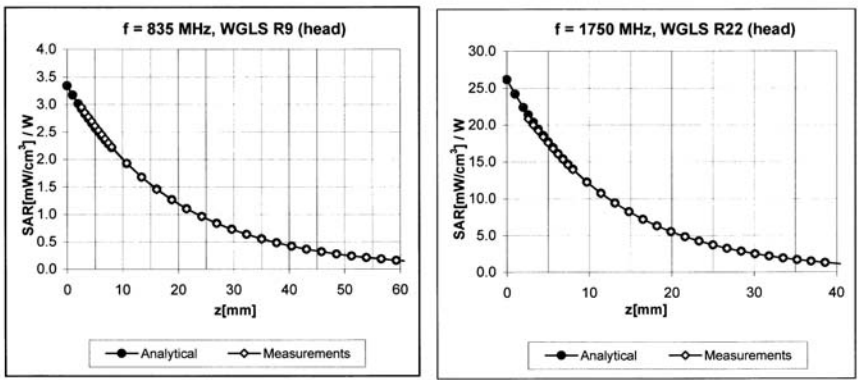


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ES3-3066_Feb10 Page 9 of 11

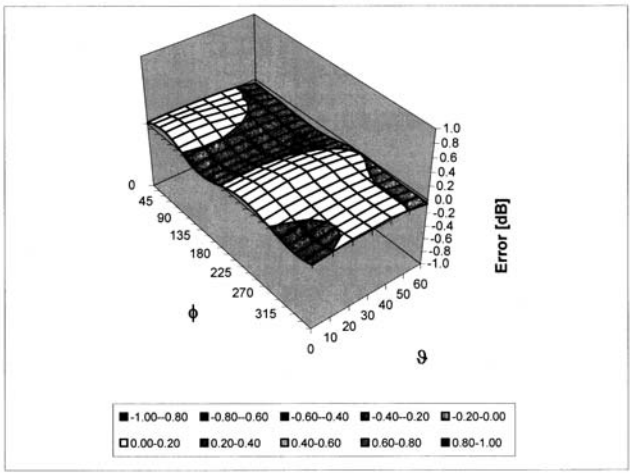
ES3DV3 SN:3066 February 24, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Certificate No: ES3-3066_Feb10 Page 10 of 11

ES3DV3 SN:3066 February 24, 2010

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Accreditation No.: SCS 108

Client LG (Dymstec)

Certificate No: D835V2-471_Jan09

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 471
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	January 19, 2009
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 (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 20, 2009