Picture 7: Body SAR Front to the phantom

Picture 8: Body SAR Back to the phantom with earphone

Picture 9: Body SAR Back to the phantom with belt

Picture 10: Body SAR Front to the phantom with belt

Picture 11: Body SAR Front to the phantom with belt with earphone

ANNEX B Graphical Results

B.1 Maximum head SAR of PCS 1900 band – Middle channel, Right cheek mode

Test Laboratory: CTTL

FCC_PCS1900_Head_RightCheek_Mid_2009.07.31

DUT: Sonim XP2 spirit; Type: --; Serial: --

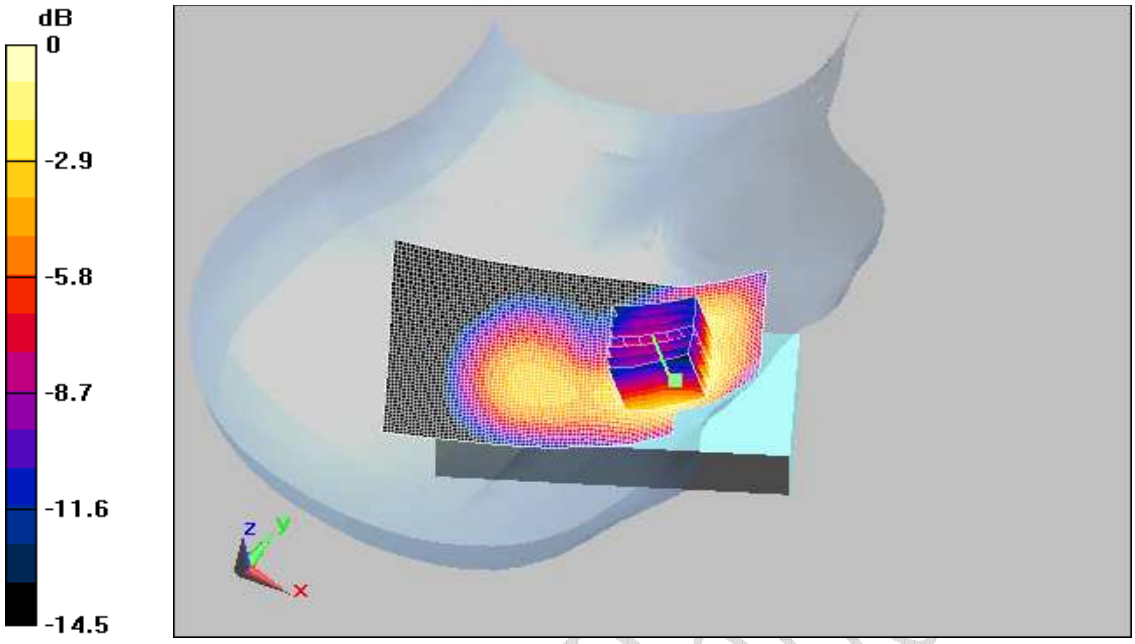
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.94, 4.94, 4.94); Calibrated: 4/14/2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated: 4/17/2009
- Phantom: West SAM; Type: SAM; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

PCS_Touch_Right/Area Scan (91x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.757 mW/g

PCS_Touch_Right/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.17 V/m; Power Drift = -0.081 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.415 mW/g
Maximum value of SAR (measured) = 0.741 mW/g



0 dB = 0.741mW/g

B.2 Maximum body SAR without belt of PCS 1900 band – Middle channel, back side, EGPRS mode

Test Laboratory: CTTL

FCC_PCS1900_Body_EGPRS_Back_2009.09.03

DUT: GSM GPRS mobile phone; Type: Sonim XP2 spirit; Serial: 001080000000480

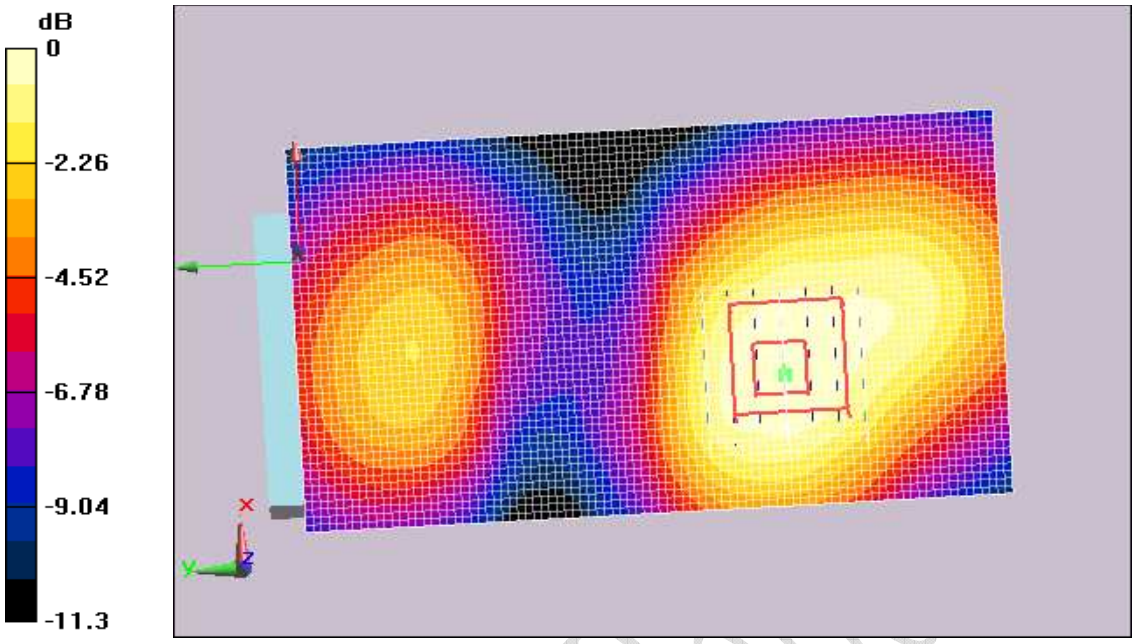
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.59 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.53, 4.53, 4.53); Calibrated: 4/14/2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated: 4/17/2009
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

EGPRS_Back_Mid/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.351 mW/g

EGPRS_Back_Mid/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.15 V/m; Power Drift = 0.259 dB
Peak SAR (extrapolated) = 0.449 W/kg
SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.206 mW/g
Maximum value of SAR (measured) = 0.342 mW/g



0 dB = 0.342mW/g

B.3 Maximum body SAR with belt of PCS 1900 band – Middle channel, front side, EGPRS mode

Test Laboratory: CTTL

FCC_PCS1900_Body_EGPRS_Face_Mid_2009.09.07

DUT: GSM GPRS mobile phone; Type: Sonim XP2 spirit; Serial: 001080000000480

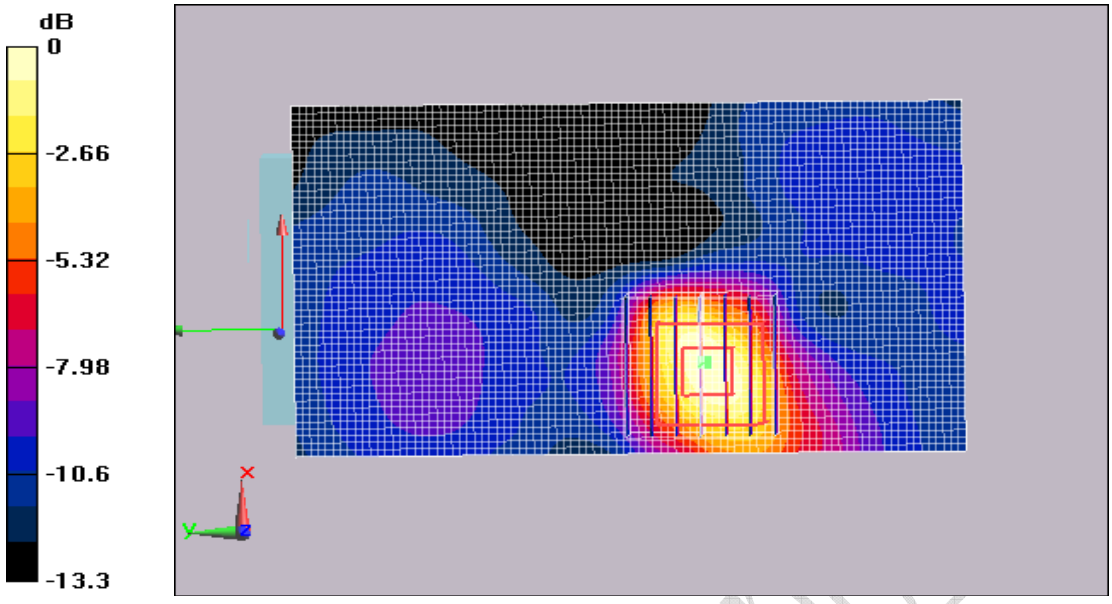
Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.59 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.53, 4.53, 4.53); Calibrated: 4/14/2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated: 4/17/2009
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

EGPRS_Face_Mid/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.299 mW/g

EGPRS_Face_Mid/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.92 V/m; Power Drift = -0.287 dB
Peak SAR (extrapolated) = 0.398 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.122 mW/g
Maximum value of SAR (measured) = 0.275 mW/g



0 dB = 0.275mW/g

Annex C System Performance Check Graphical Results

C.1 Head 1900 band

Test Laboratory: CTTL

Vali_HSL1900_24dBm_20090731

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d024

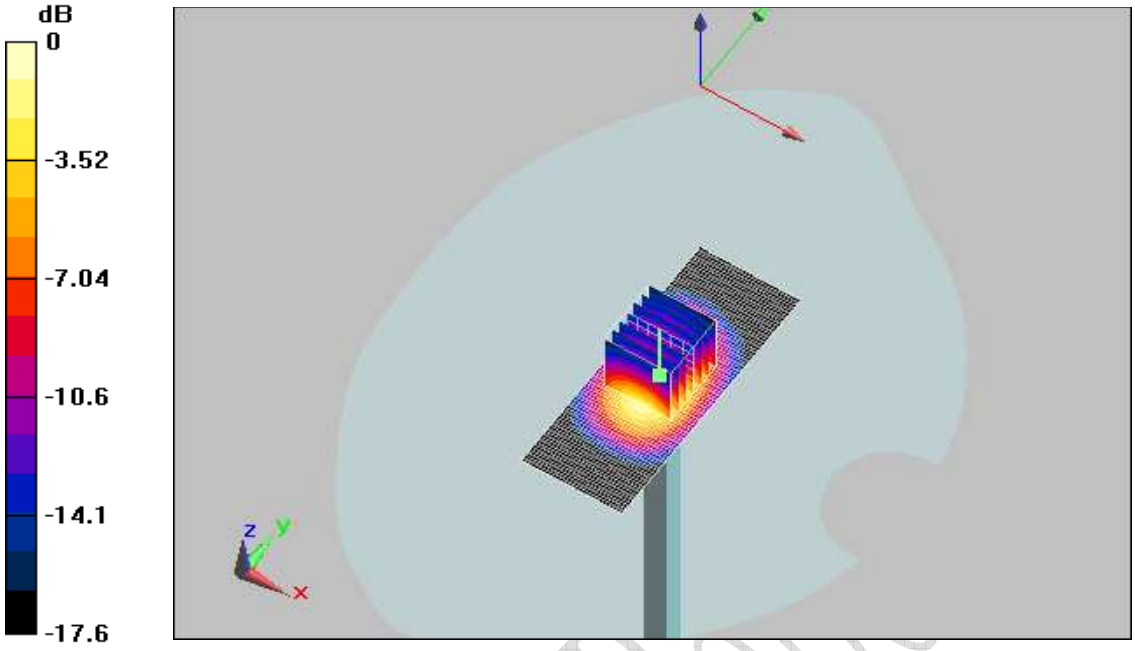
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.44 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.94, 4.94, 4.94); Calibrated: 4/14/2009
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated: 4/17/2009
- Phantom: West SAM; Type: SAM; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

d=10mm,Pin=24dbm/Area Scan (31x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12 mW/g

d=10mm,Pin=24dbm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.4 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 17.5 W/kg
SAR(1 g) = 9.33 mW/g; SAR(10 g) = 4.85 mW/g
Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

C.2 Body 1900 band

Test Laboratory: CTTL

Vali_MSL1900_24dBm_20090903

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d024

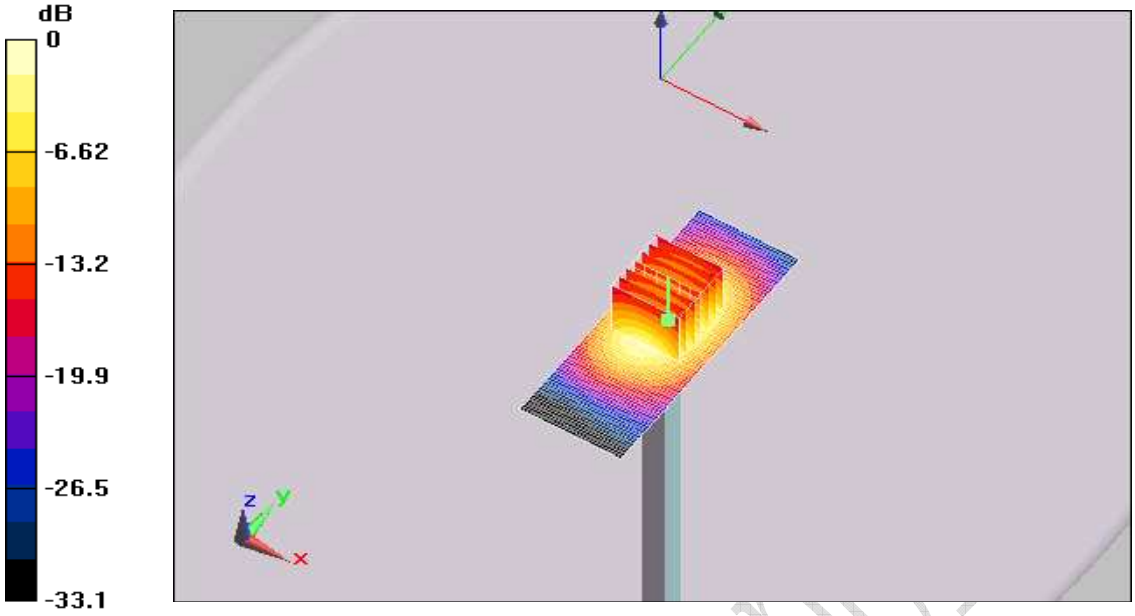
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.59 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.53, 4.53, 4.53); Calibrated: 4/14/2009
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated: 4/17/2009
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

d=10mm,Pin=24dbm 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.7 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 19 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 12.4 mW/g

d=10mm,Pin=24dbm 2/Area Scan (31x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.3 mW/g



0 dB = 13.3mW/g

C.3 Body 1900 band

Test Laboratory: CTTL

Vali_MSL1900_24dBm_20090907

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d024

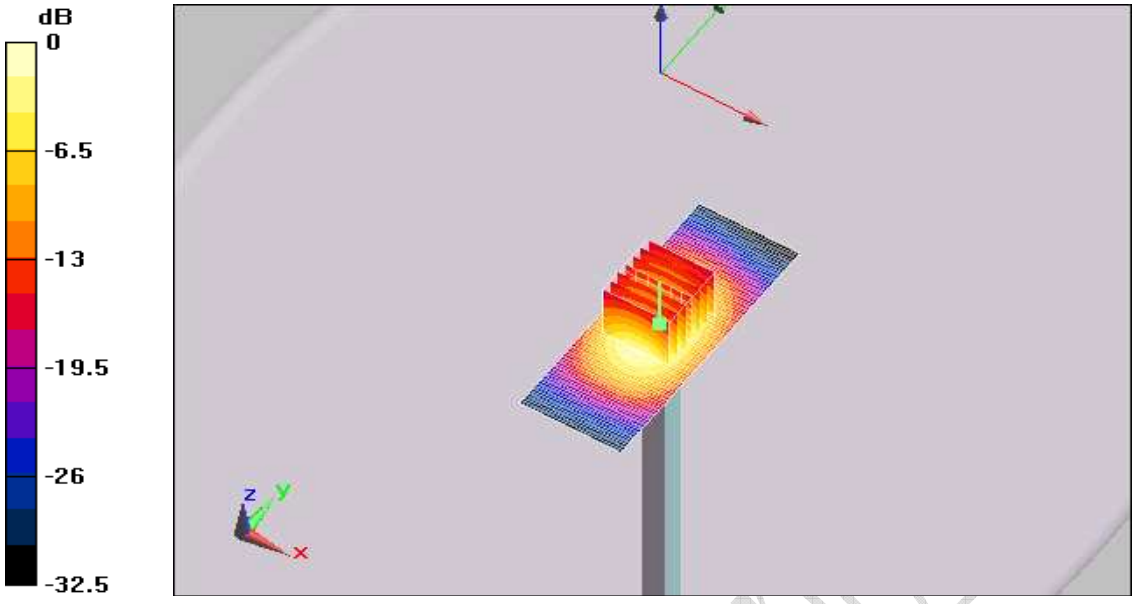
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.59 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY4 Configuration:

- Probe: ES3DV3 - SN3158; ConvF(4.53, 4.53, 4.53); Calibrated: 4/14/2009
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn797; Calibrated:4/17/2009
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: --
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

d=10mm,Pin=24dbm 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.8 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 9.48 mW/g; SAR(10 g) = 4.86 mW/g
Maximum value of SAR (measured) = 11.5 mW/g

d=10mm,Pin=24dbm 2/Area Scan (31x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.3 mW/g



0 dB = 12.3mW/g

ANNEX D Probes Calibration Certificates

The System Validation was conducted following the requirements of standard IEEE 1528: 2003 Clause 8.3.
The scanned copy of the calibration certificate of the probe used is as following.

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 CTTL (PTT) Certificate No: ES3-3158_Apr09

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3158
Calibration procedure(s)	QA CAL-01.v6 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	April 14, 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 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. 217-01025)	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	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

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

Issued: April 15, 2009

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

Certificate No: ES3-3158_Apr09 Page 1 of 9

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

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
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 (no uncertainty required). DCP does not depend on frequency nor media.
- *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.

ES3DV3 SN:3158 April 14, 2009

Probe ES3DV3

SN:3158

Manufactured:	August 13, 2007
Last calibrated:	April 7, 2008
Recalibrated:	April 14, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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ES3DV3 SN:3158 April 14, 2009

DASY - Parameters of Probe: ES3DV3 SN:3158

Sensitivity in Free Space[A] Diode Compression[B]

NormX	1.13 ± 10.1%	μV/(V/m)²	DCP X	94 mV
NormY	1.23 ± 10.1%	μV/(V/m)²	DCP Y	93 mV
NormZ	1.21 ± 10.1%	μV/(V/m)²	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	9.4	5.5
SAR_{be} [%]	With Correction Algorithm	0.9	0.7

TSL 1750 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	11.9	7.9
SAR_{be} [%]	With Correction Algorithm	0.9	0.6

Sensor Offset

Probe Tip to Sensor Center	2.0 mm

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%.

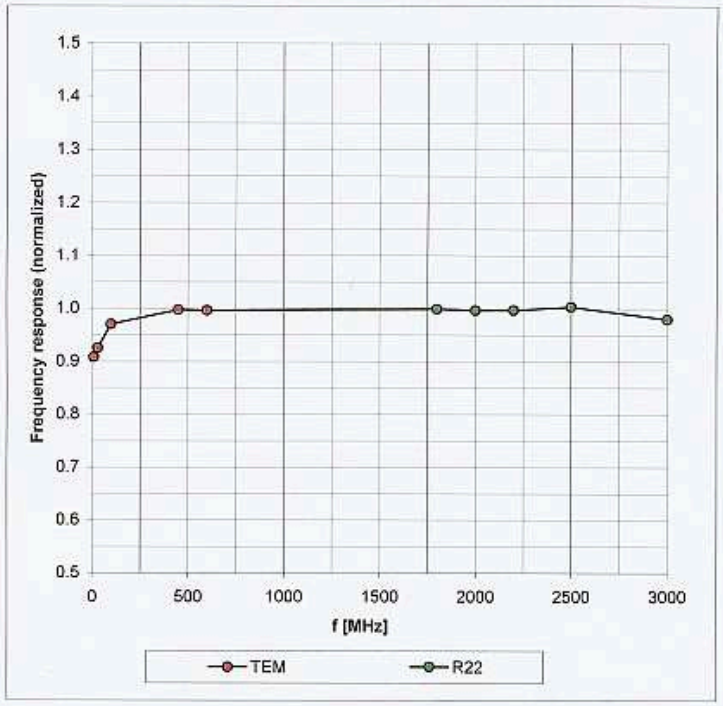
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3158 April 14, 2009

Frequency Response of E-Field

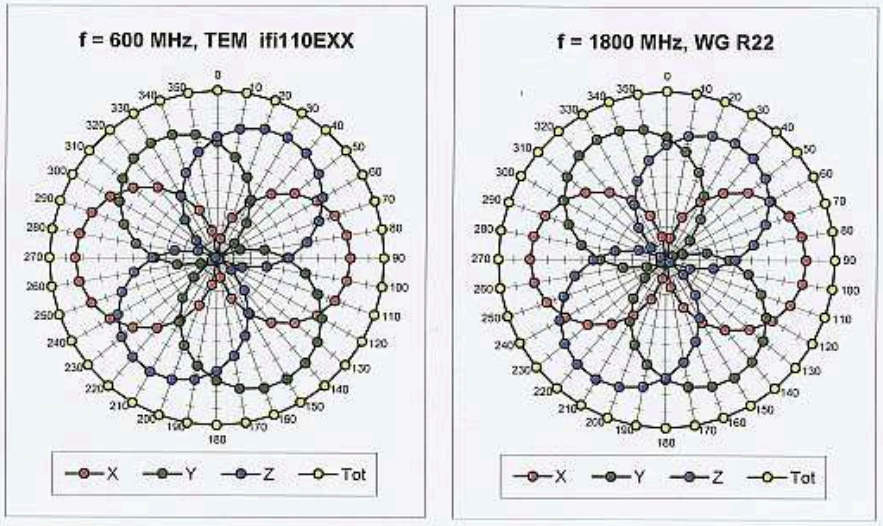
(TEM-Cell:ifi110 EXX, Waveguide: R22)

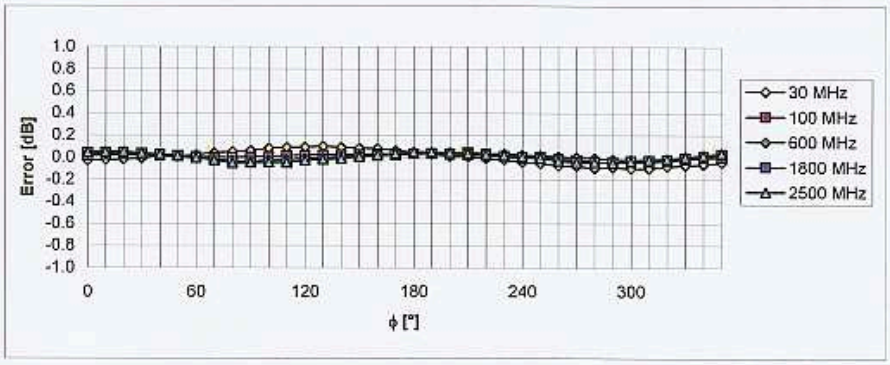


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV3 SN:3158 April 14, 2009

Receiving Pattern (ϕ), ϑ = 0°





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

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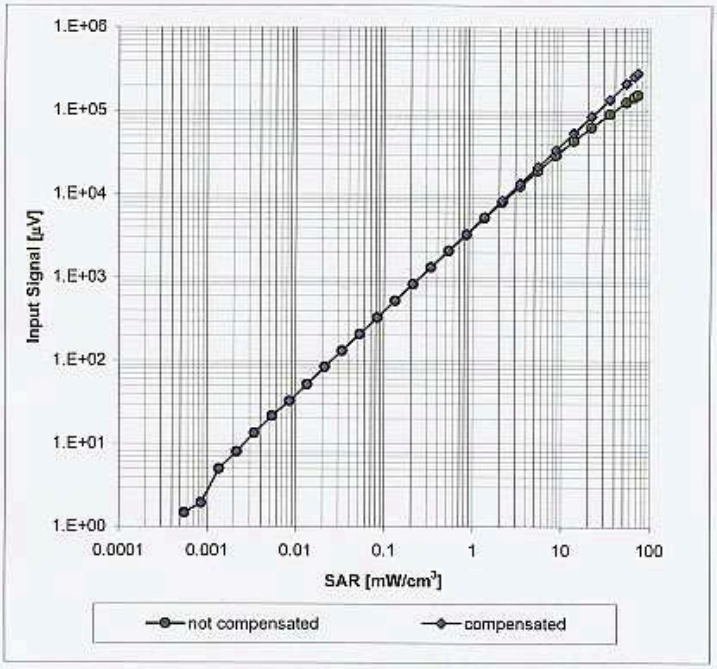
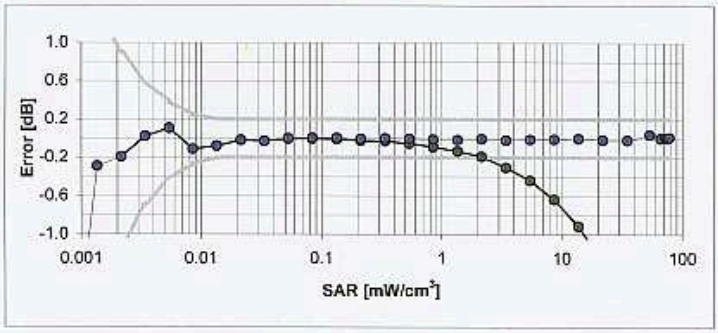
ES3DV3 SN:3158 April 14, 2009

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)





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

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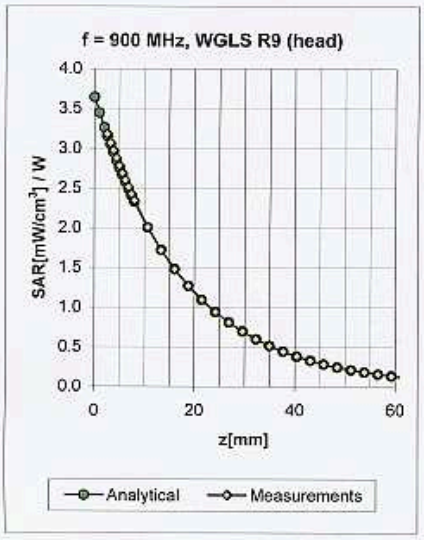
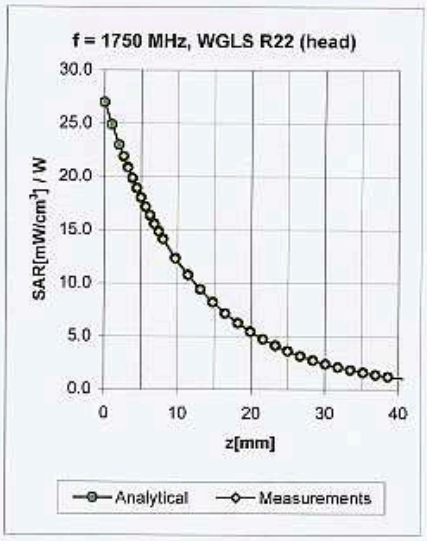
ES3DV3 SN:3158 April 14, 2009

Conversion Factor Assessment





f [MHz]	Validity [MHz][c]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.89	1.08	5.90 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.75	1.14	5.74 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.26	2.42	5.06 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.40	1.72	4.94 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.38	1.72	4.79 ± 11.0% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.75	1.22	5.83 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.82	1.17	5.68 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.32	2.67	4.81 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.29	3.21	4.53 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.31	2.91	4.55 ± 11.0% (k=2)

[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.

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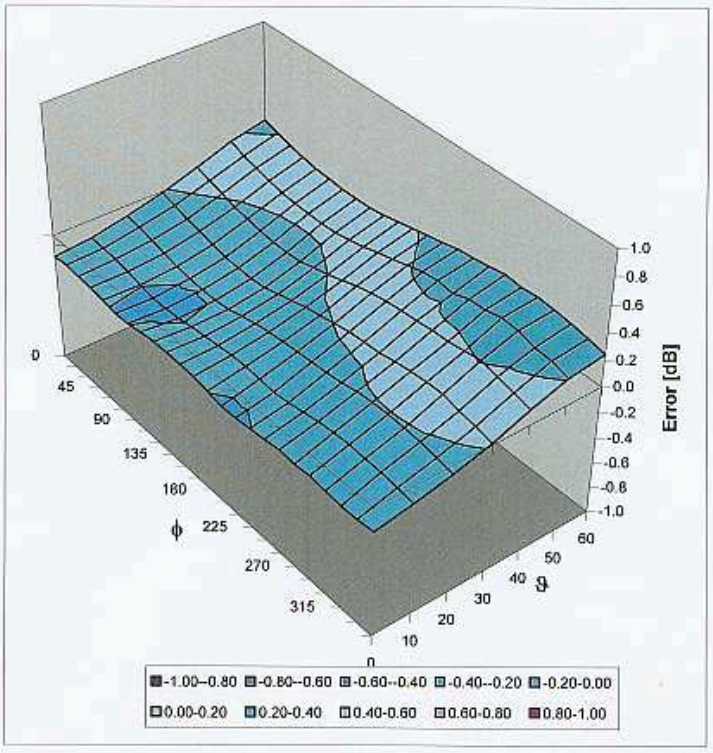
ES3DV3 SN:3158 April 14, 2009

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

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ANNEX E Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

The End of this Report