

Appendix A – System Performance Check

Date/Time: 8/25/2005 4:43:40 PM Date/Time: 8/25/2005 4:51:54 PM

Test Laboratory: A Test Lab Techno Corp.

System Performance Check at 1800MHz_20050825_Head

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:2d057

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Head 1800MHz Medium parameters used: $f = 1800 \text{ MHz}$; $s = 1.43 \text{ mho/m}$; $\epsilon_r = 39.9$;density = 1000 kg/m^3 ; Amb Temp.: 22.1 Liquid Temp.: 22.0

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

System Performance Check at 1800MHz/Area Scan (61x71x1):

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 11.5 mW/g

System Performance Check at 1800MHz/Zoom Scan (5x5x7)/Cube 0:

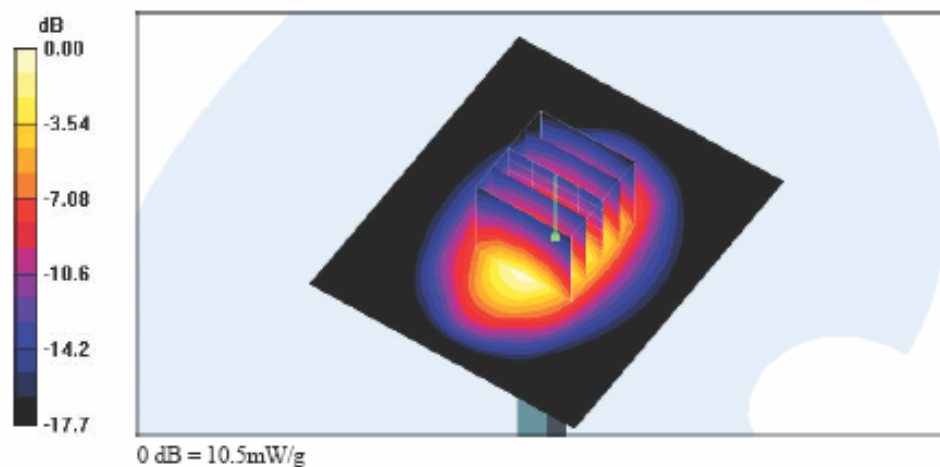
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 89.1 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 16.2 W/kg

SAR(1 g) = 9.4 mW/g; SAR(10 g) = 4.99 mW/g

Maximum value of SAR (measured) = 10.5 mW/g



Head-Tissue-Simulating-Liquid 1800MHz

Date/Time: 8/25/2005 04:20:36 PM Date/Time: 8/25/2005 04:28:49 PM

Test Laboratory: A Test Lab Techno Corp.

System Performance Check at 1800MHz_20050825_Body**DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:2d057**

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

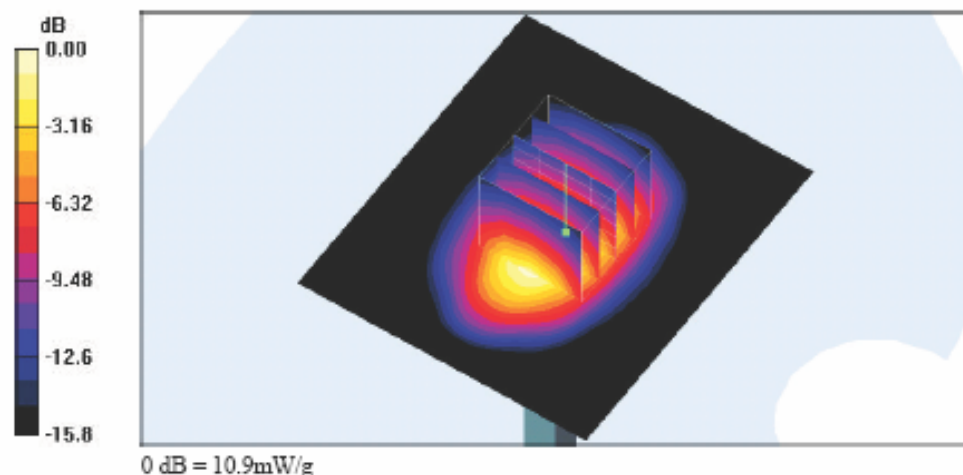
Medium: Body 1800MHz Medium parameters used: $f = 1800 \text{ MHz}$; $s = 1.52 \text{ mho/m}$; $\epsilon_r = 53.3$;density = 1000 kg/m^3 ; Amb Temp.: 22.3 Liquid Temp.: 22.0

Phantom section: Flat Section

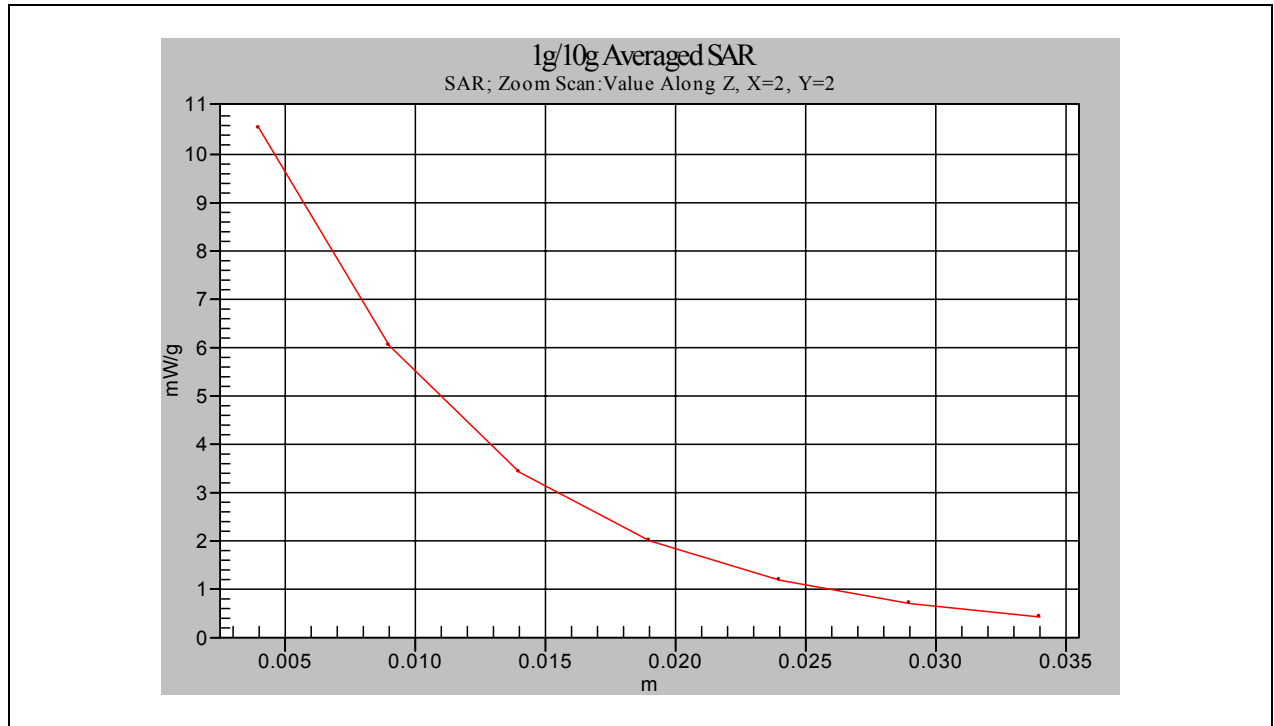
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

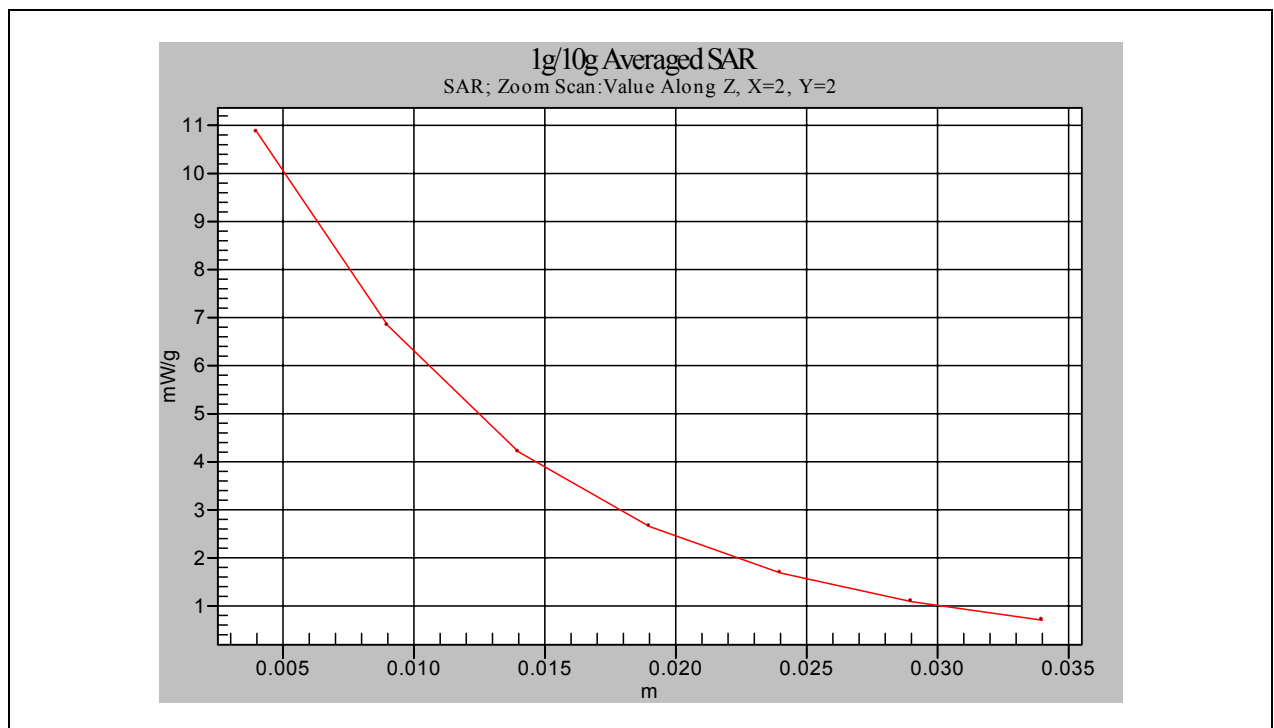
- Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

System Performance Check at 1800MHz/Area Scan (61x71x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 12.0 mW/g **System Performance Check at 1800MHz/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 89.9 V/m ; Power Drift = -0.027 dB Peak SAR (extrapolated) = 15.5 W/kg SAR(1 g) = 9.72 mW/g ; SAR(10 g) = 5.38 mW/g Maximum value of SAR (measured) = 10.9 mW/g **Body-Tissue-Simulating-Liquid 1800MHz**

Z-axis Plot of System Performance Check



Head-Tissue-Simulating-Liquid 1800MHz



Body-Tissue-Simulating-Liquid 1800MHz

Appendix B – SAR Measurement Data

Date/Time: 8/25/2005 07:49:28 PM Date/Time: 8/25/2005 07:56:01 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Cheek_PCS CH512_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: Head 1900MHz_2005Q817 Medium parameters used (interpolated): $f = 1850.2$ MHz; $s = 1.4$ mho/m; $\epsilon_r = 39.4$; density = 1000 kg/m³; Amb. Temp.: 22.5 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Flat/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.214 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

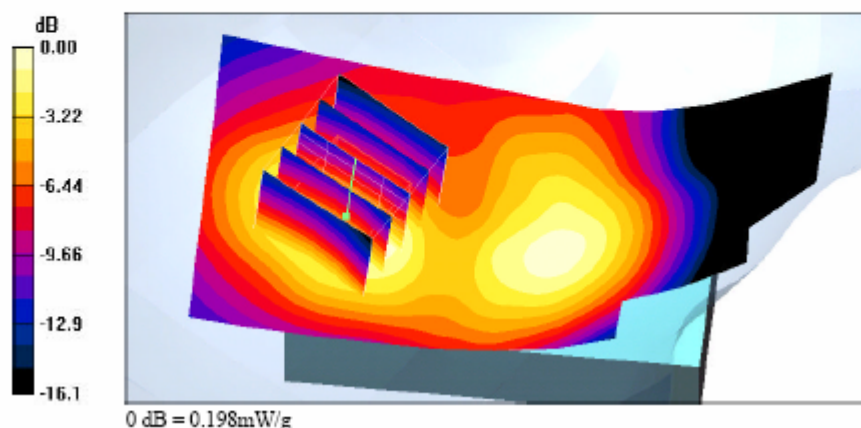
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.113 mW/g

Maximum value of SAR (measured) = 0.198 mW/g



Head-SAR Test Result for Right Cheek Position – Channel 512

Date/Time: 8/25/2005 8:12:12 PM Date/Time: 8/25/2005 8:19:27 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Cheek_PCS CH661_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1880 MHz; Duty Cycle: 1:8.3

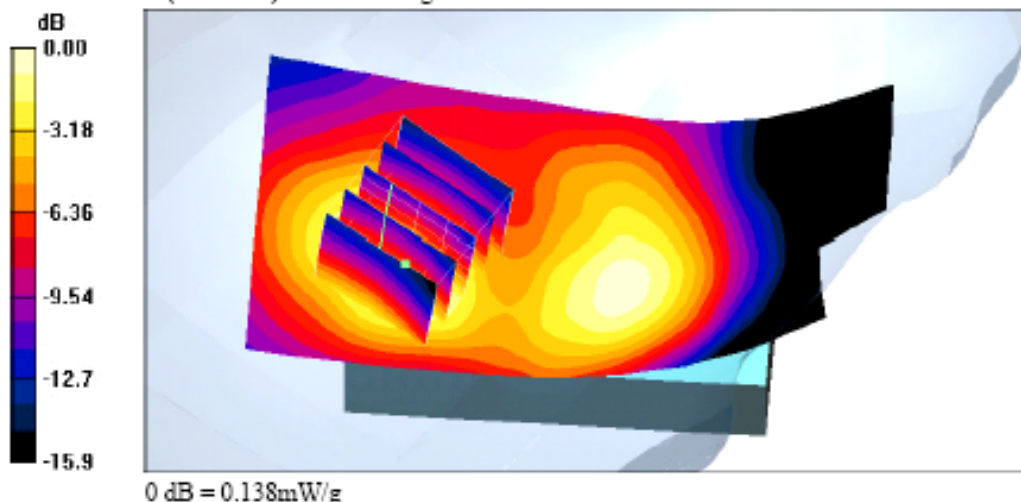
Medium: Head 1900MHz_20050817 Medium parameters used: $f = 1880$ MHz; $s = 1.42$ mho/m; $\epsilon_r = 39.3$;density = 1000 kg/m^3 ; Amb. Temp.: 22.3 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Right Cheek/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.144 mW/g **Right Cheek/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 10.3 V/m ; Power Drift = -0.057 dB Peak SAR (extrapolated) = 0.192 W/kg SAR(1 g) = 0.126 mW/g ; SAR(10 g) = 0.077 mW/g Maximum value of SAR (measured) = 0.138 mW/g **Head-SAR Test Result for Right Cheek Position – Channel 661**

Date/Time: 8/25/2005 8:26:22 PM Date/Time: 8/25/2005 8:33:45 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Cheek_PCS CH810_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Head 1900MHz_20050817 Medium parameters used (interpolated): $f = 1909.8$ MHz; $s = 1.45$ mho/m; $\epsilon_r = 38.9$; density = 1000 kg/m³; Amb. Temp.: 22.4 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

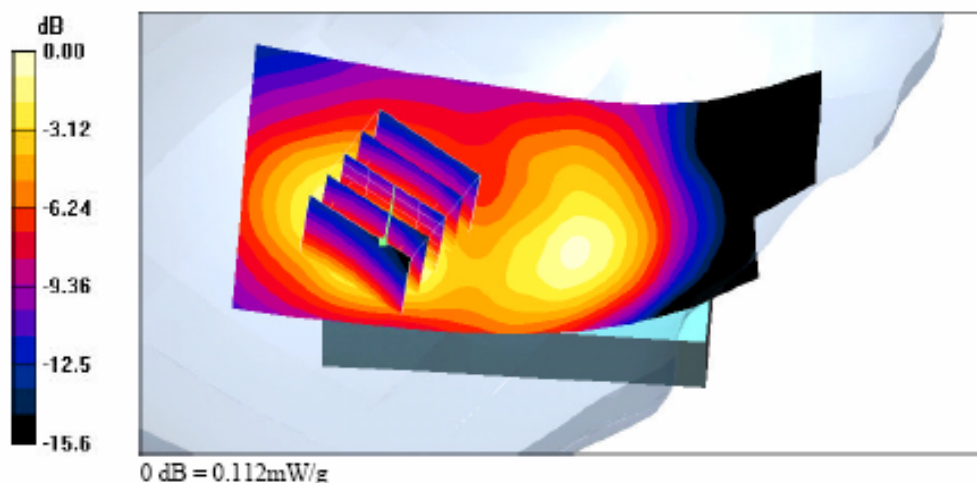
Right Cheek/Area Scan (51x101x1):Measurement grid: $dx=15$ mm, $dy=15$ mm; Maximum value of SAR (interpolated) = 0.120 mW/g**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 9.06 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.064 mW/g

Maximum value of SAR (measured) = 0.112 mW/g

**Head-SAR Test Result for Right Cheek Position – Channel 810**

Date/Time: 8/25/2005 9:29:05 PM Date/Time: 8/25/2005 9:35:42 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Tilted_PCS CH512_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

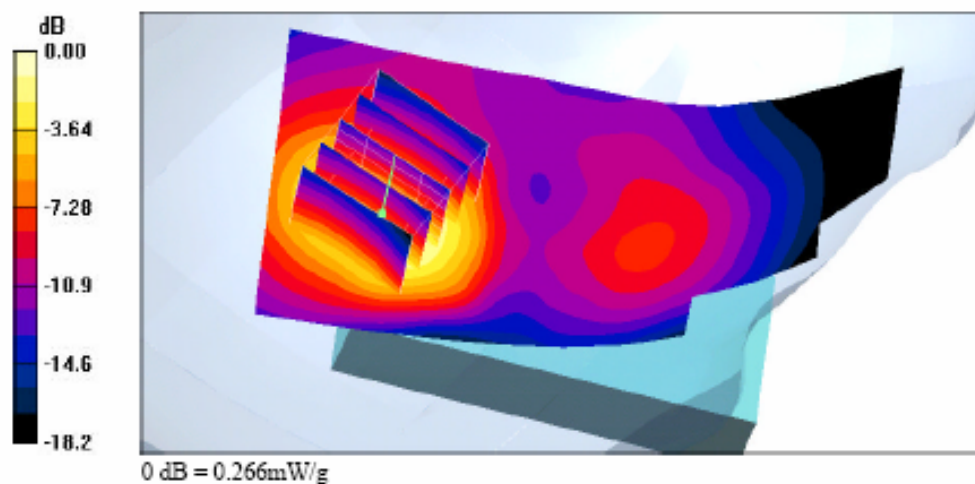
Medium: Head 1900MHz_20050817 Medium parameters used (interpolated): $f = 1850.2$ MHz; $s = 1.4$ mho/m; $\epsilon_r = 39.4$; density = 1000 kg/m^3 ; Amb. Temp.: 22.4 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Right Tilted/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.270 mW/g **Right Tilted/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 14.0 V/m ; Power Drift = -0.101 dB Peak SAR (extrapolated) = 0.385 W/kg SAR(1 g) = 0.238 mW/g ; SAR(10 g) = 0.133 mW/g Maximum value of SAR (measured) = 0.266 mW/g **Head-SAR Test Result for Right Tilted Position – Channel 512**

Date/Time: 8/25/2005 8:41:46 PM Date/Time: 8/25/2005 8:49:05 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Tilted_PCS CH661_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Mobile Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1880 MHz; Duty Cycle: 1:8.3

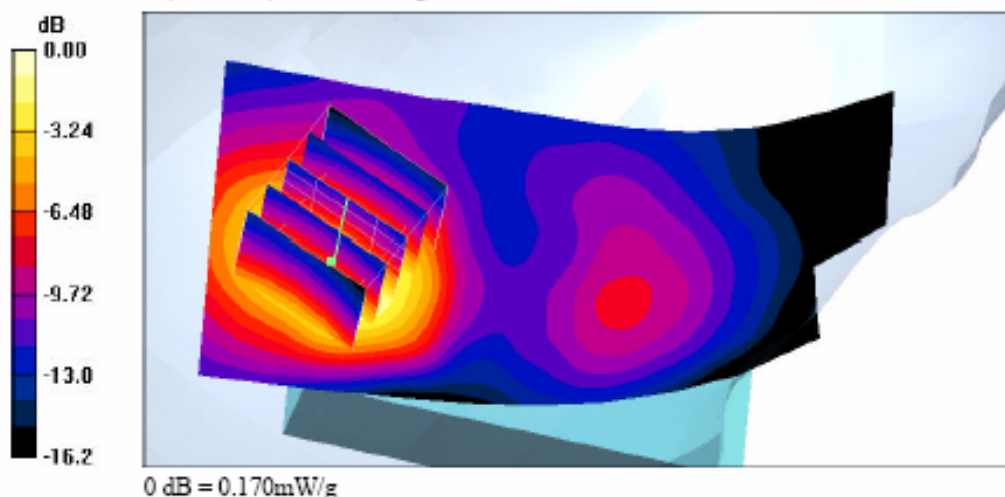
Medium: Head 1900MHz_20050817 Medium parameters used: $f = 1880$ MHz; $s = 1.42$ mho/m; $\epsilon_r = 39.3$;density = 1000 kg/m^3 ; Amb. Temp.: 22.3 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Right Tilted/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.174 mW/g **Right Tilted/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 11.1 V/m ; Power Drift = 0.028 dB Peak SAR (extrapolated) = 0.246 W/kg SAR(1 g) = 0.153 mW/g ; SAR(10 g) = 0.086 mW/g Maximum value of SAR (measured) = 0.170 mW/g **Head-SAR Test Result for Right Tilted Position – Channel 661**

Date/Time: 8/25/2005 8:56:00 PM Date/Time: 8/25/2005 9:03:21 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Right Tilted_PCS CH810_20050825**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Head 1900MHz_20050817 Medium parameters used (interpolated): $f = 1909.8$ MHz; $s = 1.45$ mho/m; $\epsilon_r = 38.9$; density = 1000 kg/m³; Amb. Temp.: 22.2 Liquid Temp.: 22.0

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Right Tilted/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.133 mW/g

Right Tilted/Zoom Scan (5x5x7)/Cube 0:

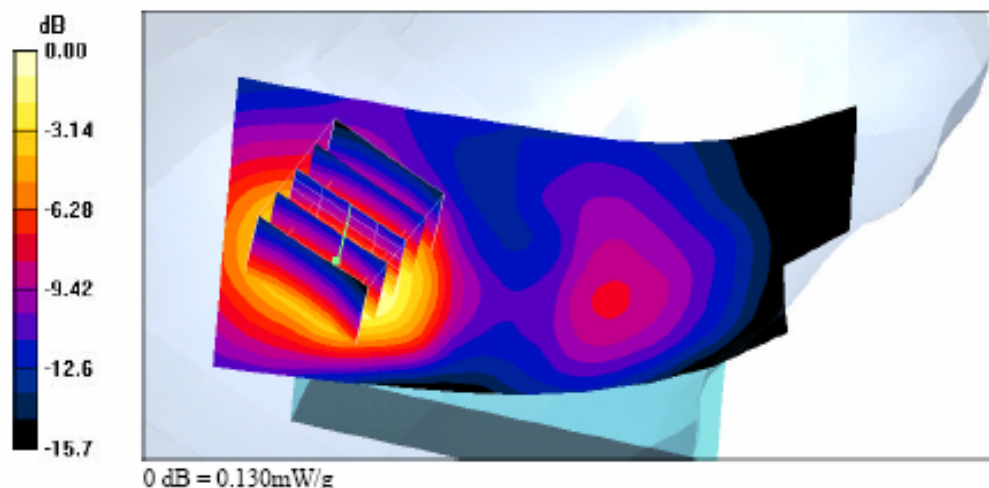
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.71 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.118 mW/g; SAR(10 g) = 0.067 mW/g

Maximum value of SAR (measured) = 0.130 mW/g

**Head-SAR Test Result for Right Tilted Position – Channel 810**

Date/Time: 8/25/2005 09:58:28 PM Date/Time: 8/25/2005 10:04:56 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Cheek_PCS CH512_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

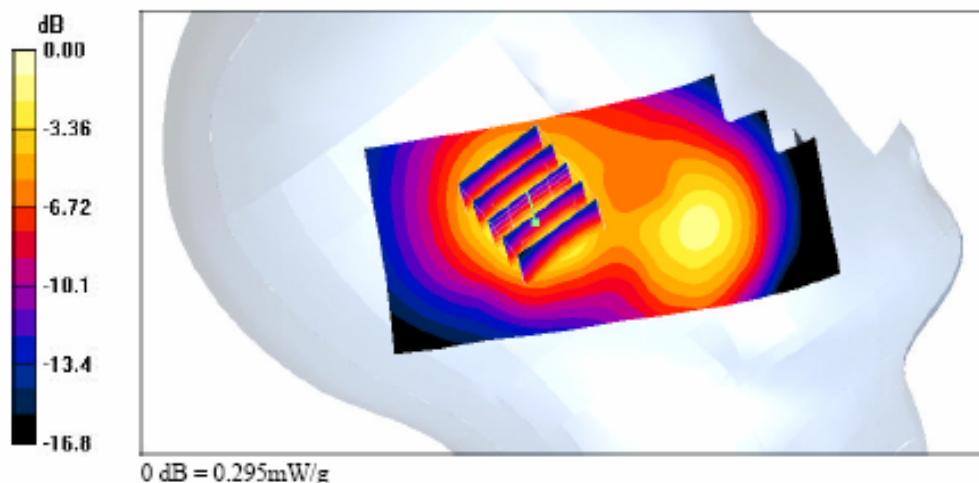
Medium: Head_1900MHz_20050124_A Medium parameters used (interpolated): $f = 1850.2$ MHz; $s = 1.4$ mho/m; $\epsilon_r = 39.2$; density = 1000 kg/m^3 ; Amb. Temp.: 22.3 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Cheek/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.318 mW/g **Left Cheek/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 13.2 V/m ; Power Drift = 0.052 dB Peak SAR (extrapolated) = 0.440 W/kg SAR(1 g) = 0.271 mW/g ; SAR(10 g) = 0.154 mW/g Maximum value of SAR (measured) = 0.295 mW/g **Head-SAR Test Result for Left Cheek Position – Channel 512**

Date/Time: 8/25/2005 9:52:49 PM Date/Time: 8/25/2005 9:59:25 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Cheek_PCS CH661_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1880 MHz; Duty Cycle: 1:8.3

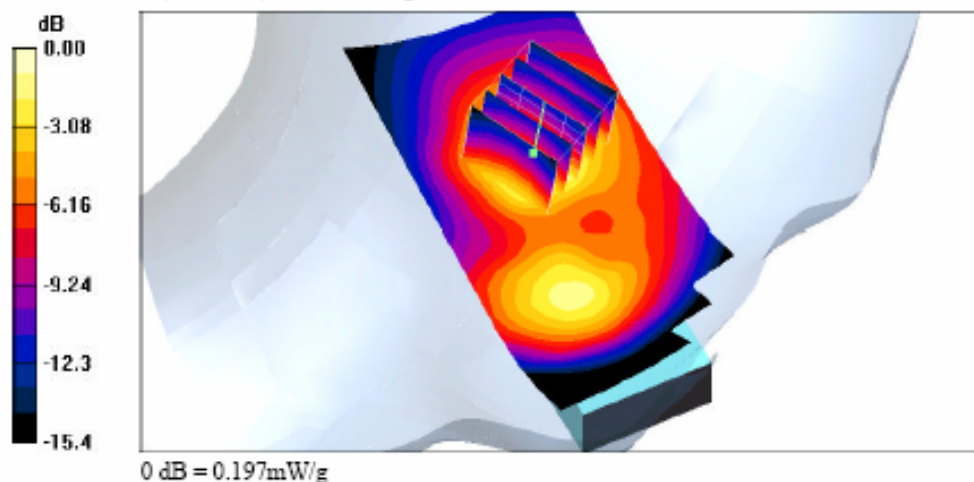
Medium: Head 1900MHz_20050817 Medium parameters used: $f = 1880$ MHz; $s = 1.42$ mho/m; $\epsilon_r = 39.3$;density = 1000 kg/m^3 ; Amb. Temp.: 22.5 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Cheek/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.215 mW/g **Left Cheek/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 11.6 V/m ; Power Drift = -0.012 dB Peak SAR (extrapolated) = 0.296 W/kg SAR(1 g) = 0.182 mW/g ; SAR(10 g) = 0.105 mW/g Maximum value of SAR (measured) = 0.197 mW/g **Head-SAR Test Result for Left Cheek Position – Channel 661**

Date/Time: 8/25/2005 9:37:22 PM Date/Time: 8/25/2005 9:43:57 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Cheek_PCS CH810_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Head 1900MHz_20050817 Medium parameters used (interpolated): $f = 1909.8$ MHz; $s = 1.45$ mho/m;
 $\epsilon_r = 38.9$; density = 1000 kg/m³; Amb. Temp.: 22.5 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Cheek/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.166 mW/g

Left Cheek/Zoom Scan (5x5x7)/Cube 0:

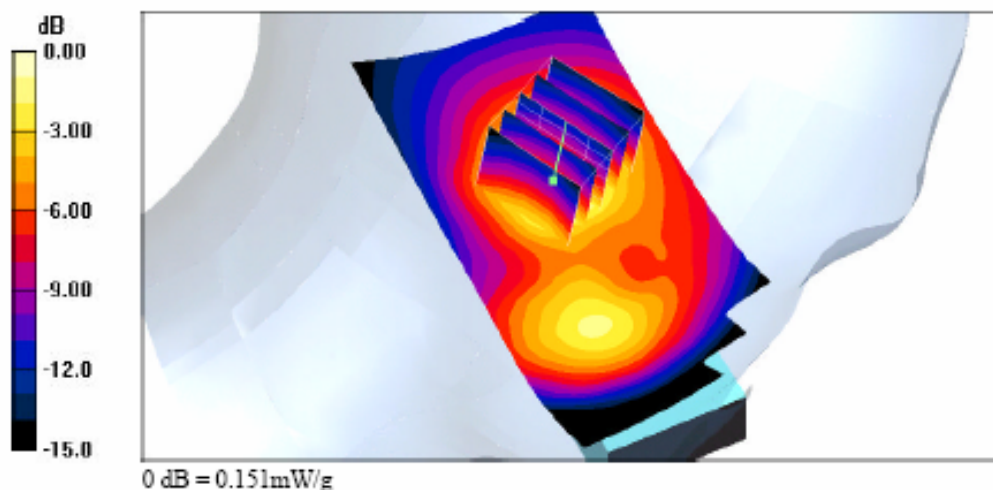
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.93 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.223 W/kg

SAR(1 g) = 0.140 mW/g; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.151 mW/g

**Head-SAR Test Result for Left Cheek Position – Channel 810**

Date/Time: 8/25/2005 10:06:35 PM Date/Time: 8/25/2005 10:15:04 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Tilted_PCS CH512_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

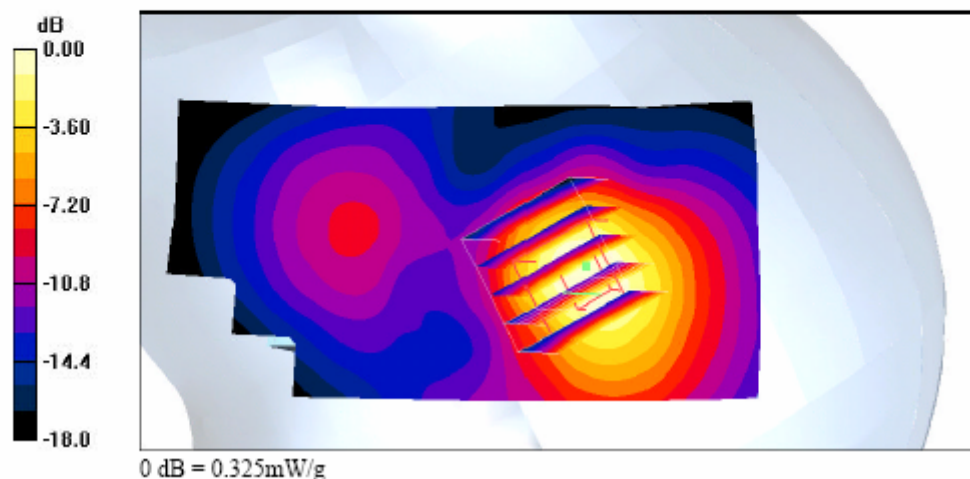
Medium: Head_1900MHz_20050124_A Medium parameters used (interpolated): $f = 1850.2$ MHz; $s = 1.4$ mho/m; $\epsilon_r = 39.2$; density = 1000 kg/m^3 ; Amb. Temp.: 22.4 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Tilted/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.345 mW/g **Left Tilted/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 14.0 V/m ; Power Drift = -0.028 dB Peak SAR (extrapolated) = 0.499 W/kg SAR(1 g) = 0.299 mW/g ; SAR(10 g) = 0.162 mW/g Maximum value of SAR (measured) = 0.325 mW/g **Head-SAR Test Result for Left Tilted Position – Channel 512**

Date/Time: 8/25/2005 10:15:24 PM Date/Time: 8/25/2005 10:22:01 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Tilted_PCS CH661_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1880 MHz; Duty Cycle: 1:8.3

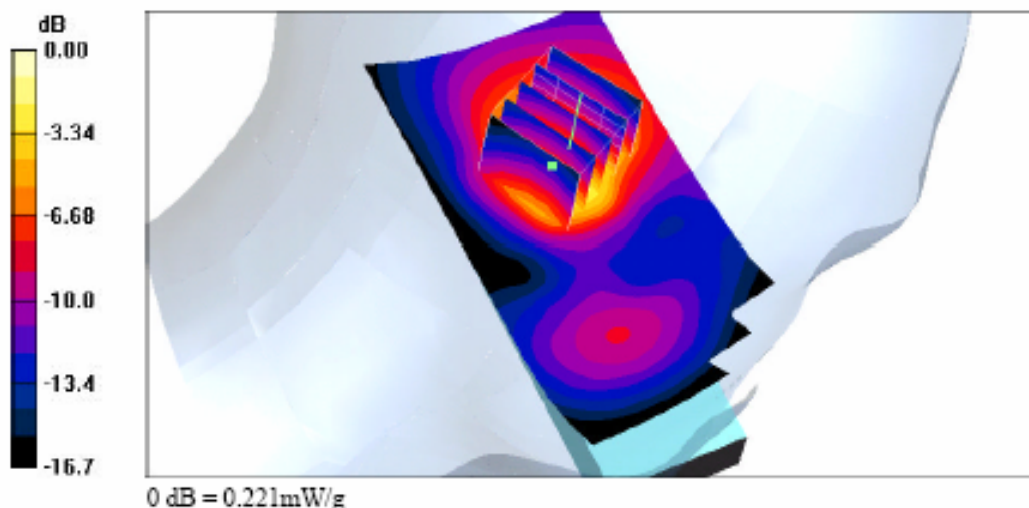
Medium: Head 1900MHz_20050817 Medium parameters used: $f = 1880$ MHz; $s = 1.42$ mho/m; $\epsilon_r = 39.3$;density = 1000 kg/m^3 ; Amb. Temp.: 22.2 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Tilted/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.244 mW/g **Left Tilted/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 12.1 V/m ; Power Drift = 0.024 dB Peak SAR (extrapolated) = 0.346 W/kg SAR(1 g) = 0.205 mW/g ; SAR(10 g) = 0.112 mW/g Maximum value of SAR (measured) = 0.221 mW/g **Head-SAR Test Result for Left Tilted Position – Channel 661**

Date/Time: 8/25/2005 10:22:44 PM/Date/Time: 8/25/2005 10:30:11 PM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Left Tilted_PCS CH810_20050825_**DUT: ASUS V66I; Type: GSM Tri-Band Mobile Phone; Serial: 357775009990074**

Communication System: PCS; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: Head 1900MHz_20050817 Medium parameters used (interpolated): $f = 1909.8$ MHz; $\sigma = 1.45$ mho/m; $\rho_r = 38.9$; density = 1000 kg/m³; Amb. Temp.: 22.2 Liquid Temp.: 22.0

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1534; ConnF(5.19, 5.19, 5.19); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP-1009
- Measurement SW: DAS4, V4.3 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Left Tilted/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.185 mW/g

Left Tilted/Zoom Scan (5x5x7)/Cube 0:

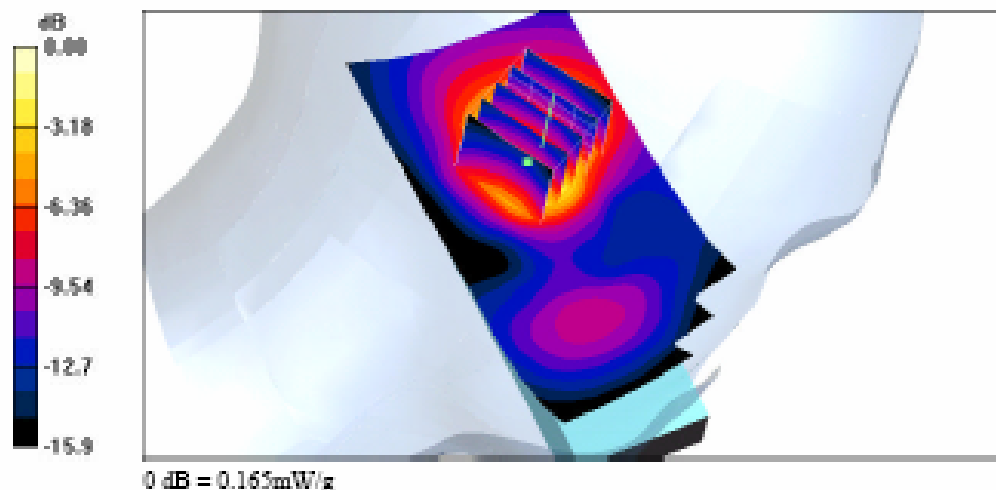
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.4 V/m; Power Drift = 0.072 dB

Peak SAR (extrapolated) = 0.259 W/kg

SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.084 mW/g

Maximum value of SAR (measured) = 0.165 mW/g

**Head-SAR Test Result for Left Tilted Position – Channel 810**

Date/Time: 8/25/2005 04:05:19 AM Date/Time: 8/25/2005 04:15:24 AM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Flat_PCS CH512_20050825_GPRS**DUT: ASUS V66I; Type: GSM Tri-Band Mobile Phone; Serial: 357775009990074**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1850.2 MHz; Duty Cycle: 1:4.2

Medium: Body 1900MHz_20050820 Medium parameters used (interpolated): $f = 1850.2$ MHz; $s = 1.52$ mho/m; $\epsilon = 51.5$; density = 1000 kg/m³; Amb. Temp.: 22.2 Liquid Temp.: 22.0

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Flat/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.355 mW/g

Flat/Zoom Scan (5x5x7)/Cube 0:

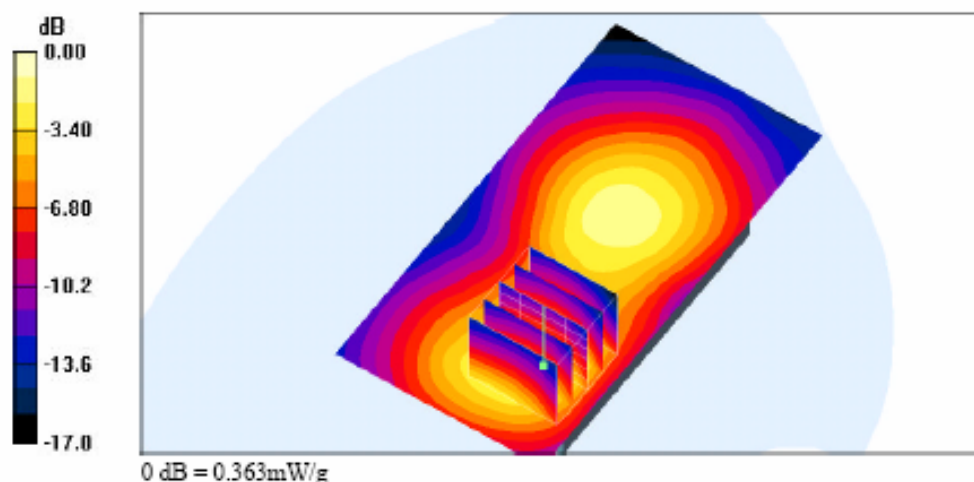
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.4 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 0.515 W/kg

SAR(1 g) = 0.321 mW/g; SAR(10 g) = 0.184 mW/g

Maximum value of SAR (measured) = 0.363 mW/g

**Body-SAR Test Result for Flat Position – Channel 512**

Date/Time: 8/26/2005 3:46:57 AM Date/Time: 8/26/2005 3:53:13 AM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Flat_PCS CH661_20050825_GPRS**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1880 MHz; Duty Cycle: 1:4.2

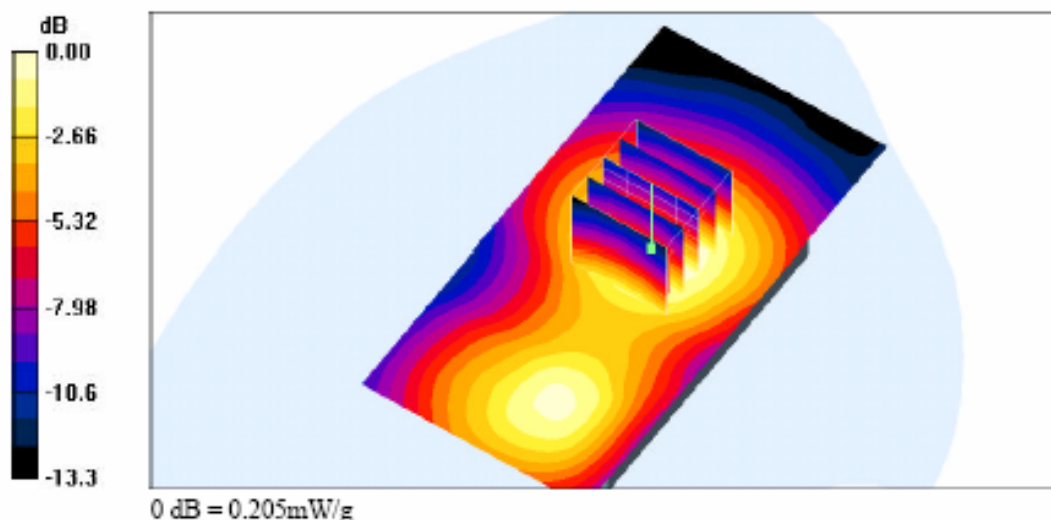
Medium: Body 1900MHZ Medium parameters used: $f = 1880 \text{ MHz}$; $s = 1.52 \text{ mho/m}$; $\epsilon_r = 52.3$;density = 1000 kg/m^3 ; AmbTemp.: 22.3 Liquid Temp.: 22.0

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Flat/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.203 mW/g **Flat/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 11.5 V/m ; Power Drift = -0.139 dB Peak SAR (extrapolated) = 0.283 W/kg SAR(1 g) = 0.191 mW/g ; SAR(10 g) = 0.124 mW/g Maximum value of SAR (measured) = 0.205 mW/g **Body-SAR Test Result for Flat Position – Channel 661**

Date/Time: 8/26/2005 4:01:21 AM Date/Time: 8/26/2005 4:07:37 AM

Test Laboratory: A Test Lab Techno Corp.

05-0531-SEO_ASUS V66I_Flat_PCS CH810_20050825_GPRS**DUT: ASUS V66I; Type: GSM Tri-Band Moblie Phone; Serial: 357775009990074**

Communication System: PCS 1900 GPRS(2Down,2Up); Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

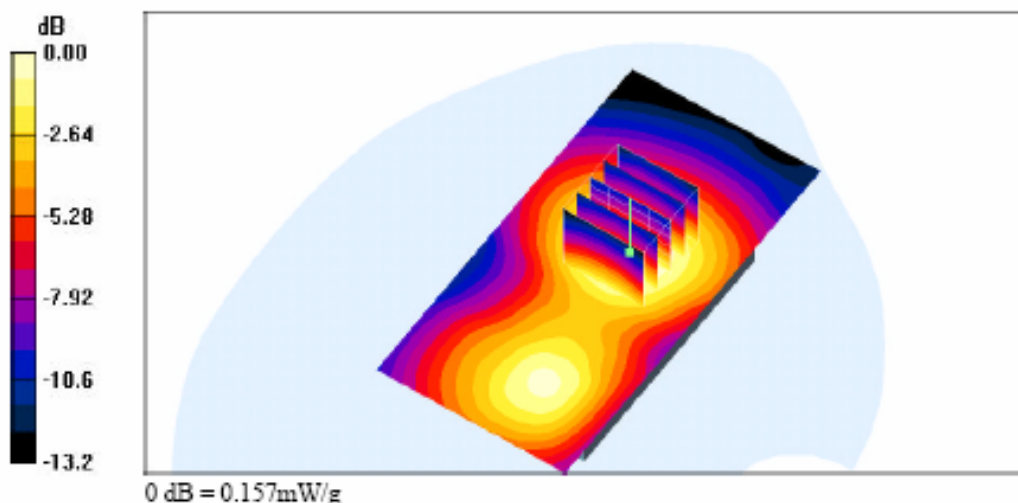
Medium: Body 1900MHZ Medium parameters used (interpolated): $f = 1909.8$ MHz; $\epsilon = 1.54$ mho/m; $\epsilon_r = 52$;density = 1000 kg/m^3 ; Amb. Temp.: 22.3 Liquid Temp.: 22.0

Phantom section: Flat Section

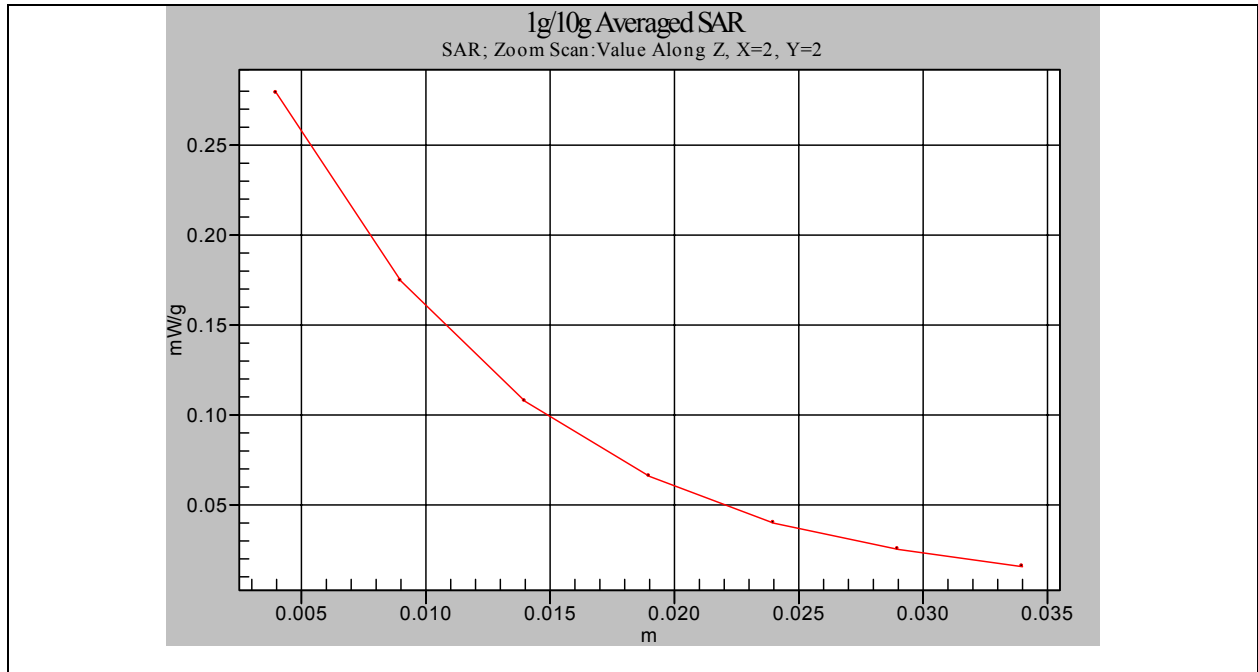
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

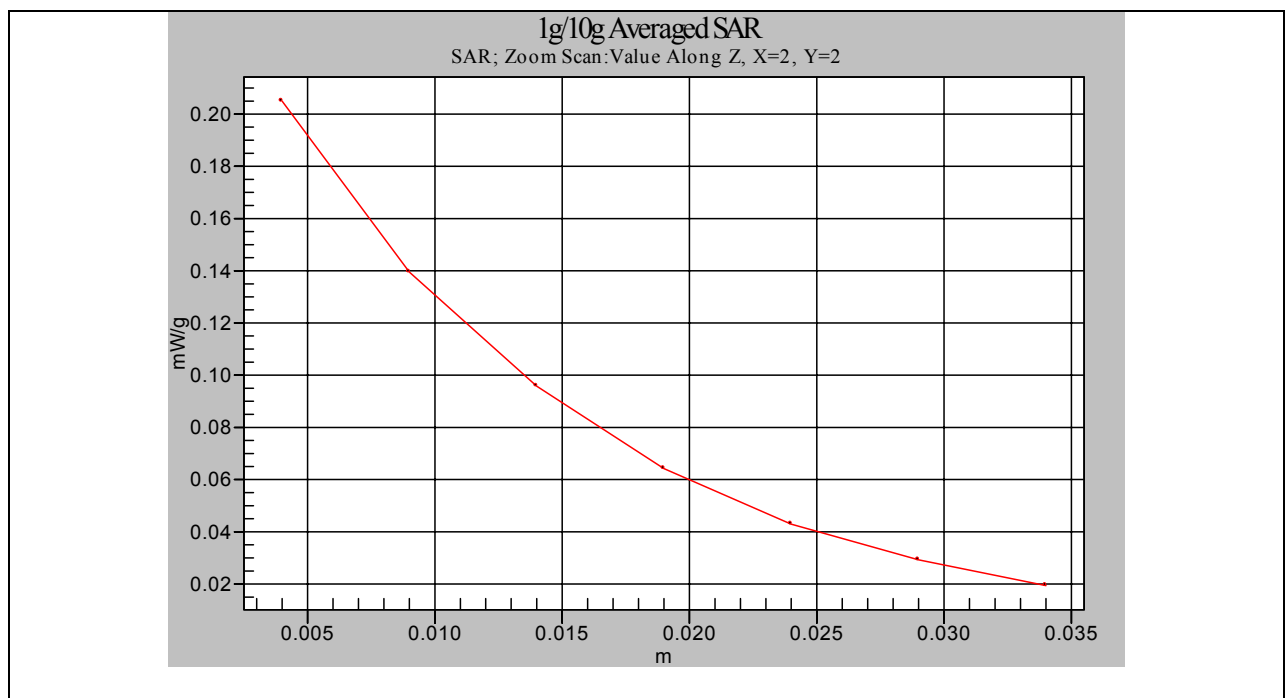
- Probe: ET3DV6 - SN1531; ConvF(4.64, 4.64, 4.64); Calibrated: 11/19/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/25/2005
- Phantom: SAM 12; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

Flat/Area Scan (51x101x1):Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$; Maximum value of SAR (interpolated) = 0.160 mW/g **Flat/Zoom Scan (5x5x7)/Cube 0:**Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$ Reference Value = 9.75 V/m ; Power Drift = 0.105 dB Peak SAR (extrapolated) = 0.224 W/kg SAR(1 g) = 0.148 mW/g ; SAR(10 g) = 0.096 mW/g Maximum value of SAR (measured) = 0.157 mW/g **Body-SAR Test Result for Flat Position – Channel 810**

Z-axis Plot for Maximum SAR



Head-SAR Test Result for Left Tilted Position – Channel 512



Body-SAR Test Result for Flat Position – Channel 512

Appendix C – Dipole Calibration

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 Federal Office of Metrology and Accreditation 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 Auden		Certificate No: D900V2-172_Jan05	
CALIBRATION CERTIFICATE			
Object	D900V2 - SN: 172		
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits		
Calibration date:	January 18, 2005		
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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06
DAE4	SN 907	03-May-04 (SPEAG, No. DAE907_May04)	May-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov-05
Calibrated by:	Name Judith Müller	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	
			Issued: January 19, 2005
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			
Certificate No: D900V2-172_Jan05		Page 1 of 9	

Calibration Laboratory of

Schmid & Partner

Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accredited by the Swiss Federal Office of Metrology and Accreditation
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
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	900 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.4 $\pm$ 6 %	0.97 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.2 $\pm$ 0.2) °C	-----	-----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	2.67 mW / g
SAR normalized	normalized to 1W	10.7 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	10.7 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.72 mW / g
SAR normalized	normalized to 1W	6.88 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.87 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.0	1.05 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.3 ± 6 %	1.07 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	2.81 mW / g
SAR normalized	normalized to 1W	11.2 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	11.0 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.82 mW / g
SAR normalized	normalized to 1W	7.28 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	7.13 mW / g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	48.6 Ω - 6.9 j Ω
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.8 Ω - 8.1 j Ω
Return Loss	- 19.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.398 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 23, 2002

DASY4 Validation Report for Head TSL

Date/Time: 01/18/05 04:23:39

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:172

Communication System: CW-900; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 900$ MHz; $\sigma = 0.97$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.95, 5.95, 5.95); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.4 Build 11; Postprocessing SW: SEMCAD, V1.8 Build 133

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.88 mW/g

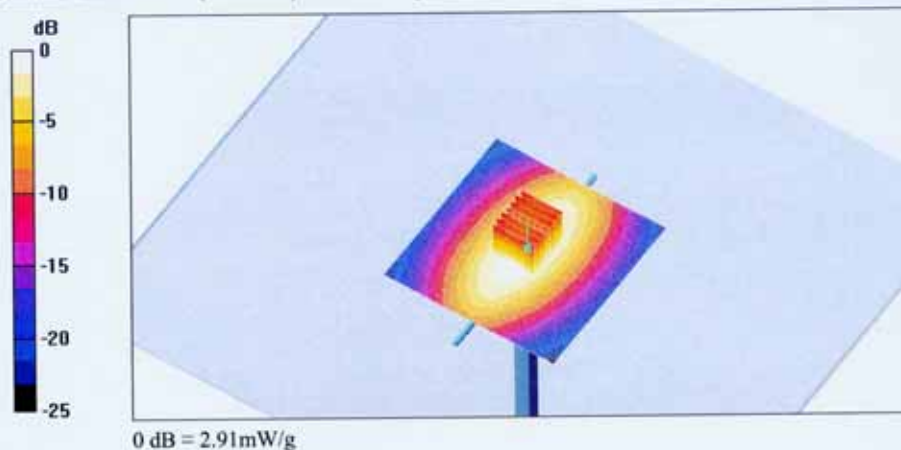
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.2 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.96 W/kg

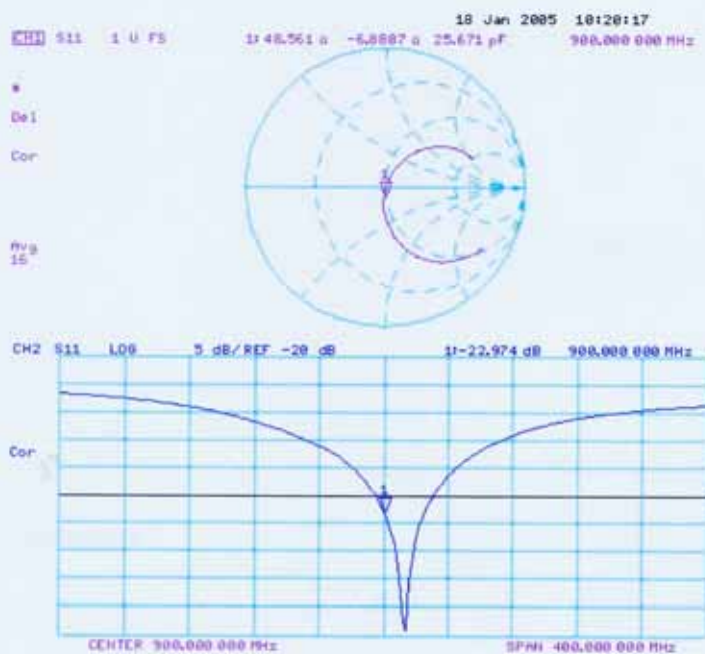
SAR(1 g) = 2.67 mW/g; SAR(10 g) = 1.72 mW/g

Maximum value of SAR (measured) = 2.91 mW/g



Certificate No: D900V2-172_Jan05

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Impedance Measurement Plot for Head TSL

DASY4 Validation Report for Body TSL

Date/Time: 01/11/05 12:19:31

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:172

Communication System: CW-900; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: MSL 900 MHz;

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 1.07 \text{ mho/m}$; $\epsilon_r = 54.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.77, 5.77, 5.77); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 03.05.2004
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.4 Build 10; Postprocessing SW: SEMCAD, V1.8 Build 133

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 3.09 mW/g

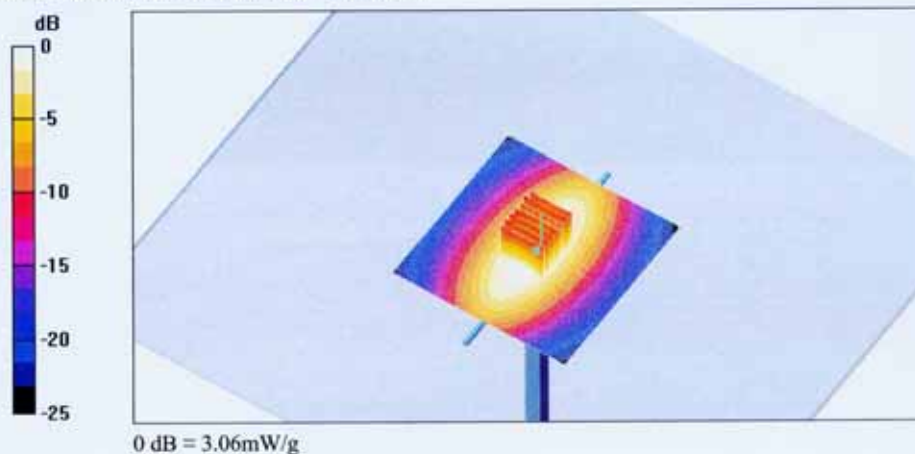
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.2 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 4.06 W/kg

SAR(1 g) = 2.81 mW/g; SAR(10 g) = 1.82 mW/g

Maximum value of SAR (measured) = 3.06 mW/g



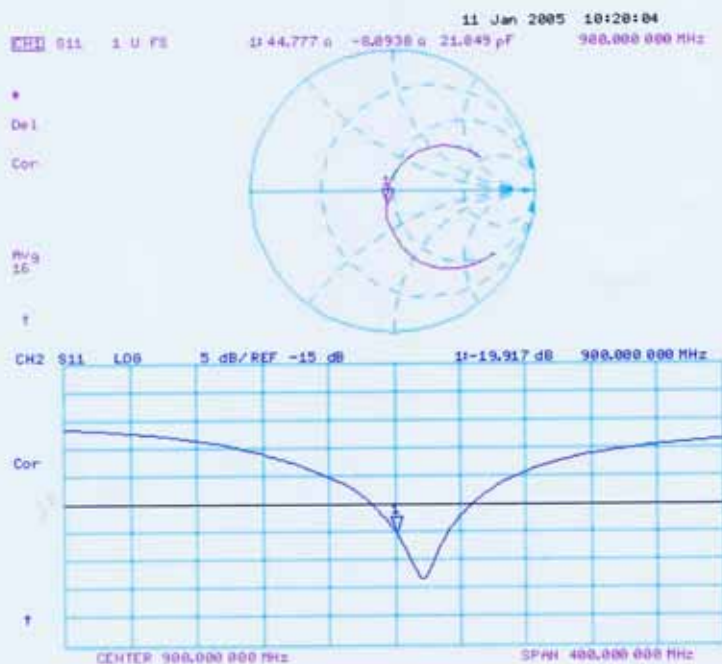
ATL Techno. Corp. RF Testing Lab

Tao-Yuan Lab : No. 19, Lane 772, Ho-Ping Rd., Pa-Te City, Taoyuan Hsien, Taiwan R.O.C.

Tel : 886-(0)3-366-5952 / Fax : 886-(0)3-3635002

Shin-Tien Lab : No. 99, An-Chung Rd., Hsin-Tien City, Taipei Hsien, Taiwan R.O.C.

Tel : 886-(0)2-82122828 / Fax : 886-(0)2-82122829

Test Report No : 05-0531-S-00-02-00**Test Dates : Aug. 25-26 , 2005****Impedance Measurement Plot for Body TSL**

Certificate No: D900V2-172_Jan05

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Calibration Laboratory of
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 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 **Auden**

 Certificate No: **D1800V2-2d057_Jan05**

CALIBRATION CERTIFICATE

 Object **D1800V2 - SN: 2d057**

 Calibration procedure(s) **QA CAL-05.v6**
 Calibration procedure for dipole validation kits

 Calibration date: **January 17, 2005**

 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov-05

	Name	Function	Signature
Calibrated by:	Judith Müller	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 20, 2005

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

Certificate No: D1800V2-2d057_Jan05

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**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 Federal Office of Metrology and Accreditation
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
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.0	1.40 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.0 $\pm$ 6 %	1.37 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.55 mW / g
SAR normalized	normalized to 1W	38.2 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	38.6 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.10 mW / g
SAR normalized	normalized to 1W	20.4 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	20.6 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.49 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	9.83 mW / g
SAR normalized	normalized to 1W	39.3 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	39.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.33 mW / g
SAR normalized	normalized to 1W	21.3 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	21.4 mW / g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	47.7 Ω - 3.3 j Ω
Return Loss	- 27.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.9 Ω - 3.7 j Ω
Return Loss	- 23.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 16, 2002

DASY4 Validation Report for Head TSL

Date/Time: 01/17/05 12:14:44

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN2d057

Communication System: CW-1800; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL 1800 MHz;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.07, 5.07, 5.07); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.4 Build 11; Postprocessing SW: SEMCAD, V1.8 Build 133

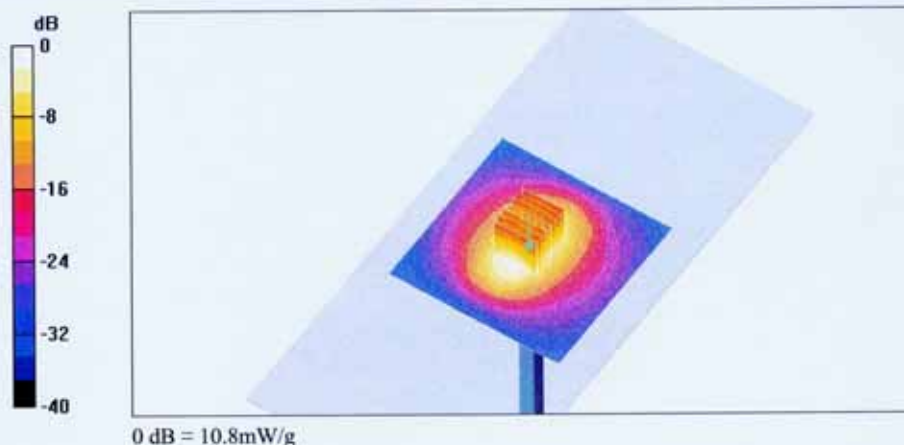
Pin = 250 mW; d = 10 mm 2/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 10.9 mW/g**Pin = 250 mW; d = 10 mm 2/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.8 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 16.3 W/kg

SAR(1 g) = 9.55 mW/g; SAR(10 g) = 5.1 mW/g

Maximum value of SAR (measured) = 10.8 mW/g



Certificate No: D1800V2-2d057_Jan05

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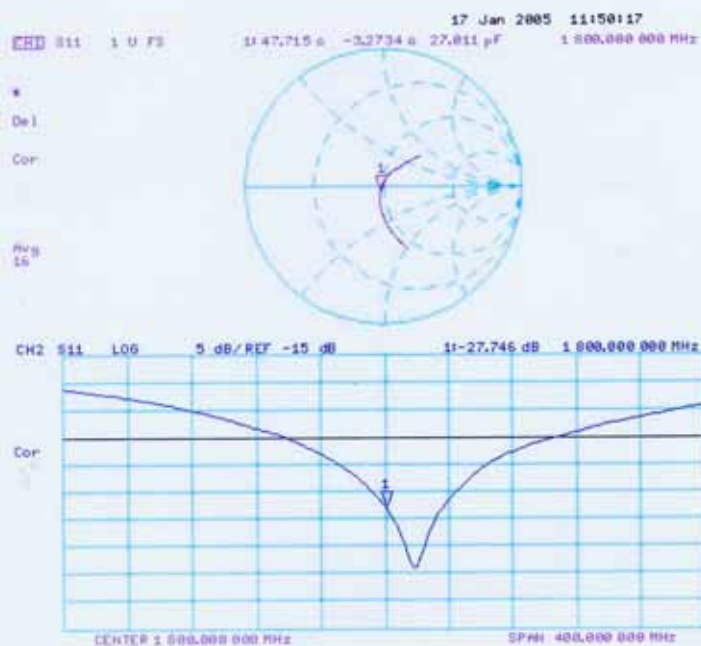
ATL Techno. Corp. RF Testing Lab

Tao-Yuan Lab : No. 19, Lane 772, Ho-Ping Rd., Pa-Te City, Taoyuan Hsien, Taiwan R.O.C.

Tel : 886-(0)3-366-5952 / Fax : 886-(0)3-3635002

Shin-Tien Lab : No. 99, An-Chung Rd., Hsin-Tien City, Taipei Hsien, Taiwan R.O.C.

Tel : 886-(0)2-82122828 / Fax : 886-(0)2-82122829

Test Report No : 05-0531-S-00-02-00**Test Dates : Aug. 25-26, 2005****Impedance Measurement Plot for Head TSL**

Certificate No: D1800V2-2d057_Jan05

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DASY4 Validation Report for Body TSL

Date/Time: 01/12/05 17:36:06

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN2d057

Communication System: CW-1800; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Muscle 1800 MHz;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.52, 4.52, 4.52); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.4 Build 11; Postprocessing SW: SEMCAD, V1.8 Build 133

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.3 mW/g

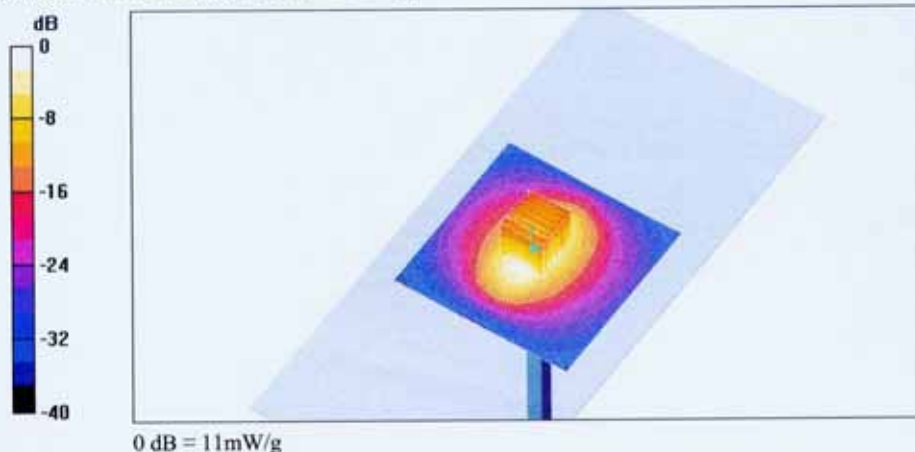
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.6 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 16.1 W/kg

SAR(1 g) = 9.83 mW/g; SAR(10 g) = 5.33 mW/g

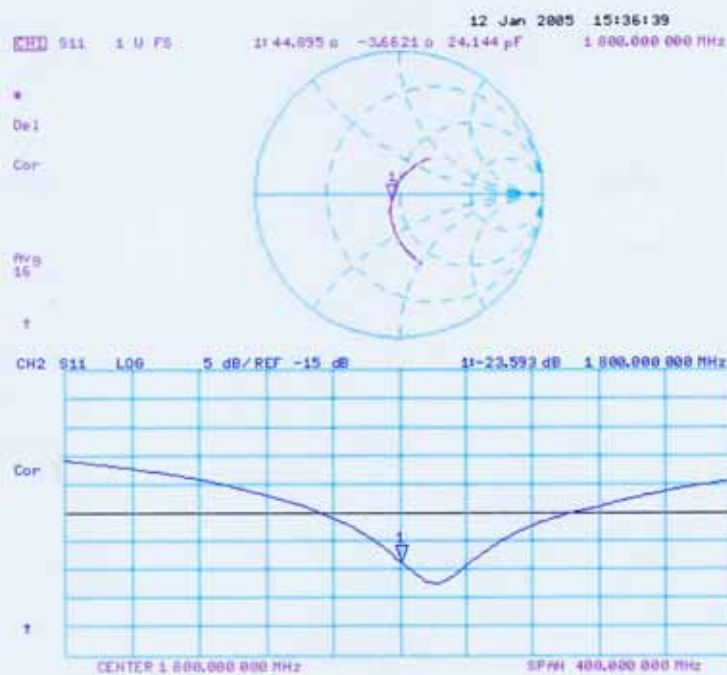
Maximum value of SAR (measured) = 11 mW/g



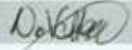
Certificate No: D1800V2-2d057_Jan05

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Impedance Measurement Plot for Body TSL



Appendix D – Probe Calibration

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 Federal Office of Metrology and Accreditation 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: Auden		Certificate No: ET3-1531_Nov04	
CALIBRATION CERTIFICATE			
Object	ET3DV6 - SN:1531		
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes		
Calibration date:	November 19, 2004		
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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	3-Apr-03 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5066 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	3-Apr-03 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN:3013	8-Jan-04 (SPEAG, No. ES3-3013_Jan04)	Jan-05
DAE4	SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-03)	In house check: Nov-04
Calibrated by:	Name Nico Vetterli	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			Issued: November 20, 2004
Certificate No: ET3-1531_Nov04		Page 1 of 9	

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



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Accredited by the Swiss Federal Office of Metrology and Accreditation
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
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z} = NORM_{x,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*.
- DCP_{x,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 $f \leq 800$ 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 **NORM_{x,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.

ET3DV6 SN:1531

November 19, 2004

Probe ET3DV6

SN:1531

Manufactured:	July 15, 2000
Last calibrated:	September 19, 2003
Recalibrated:	November 19, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1531_Nov04

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ET3DV6 SN:1531

November 19, 2004

DASY - Parameters of Probe: ET3DV6 SN:1531

Sensitivity in Free Space^A

NormX	1.43 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.49 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.55 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression^B

DCP X	94 mV
DCP Y	94 mV
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	3.7 mm	4.7 mm
SAR _{iso} [%] Without Correction Algorithm	9.7	5.1
SAR _{iso} [%] With Correction Algorithm	0.1	0.3

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance	3.7 mm	4.7 mm
SAR _{iso} [%] Without Correction Algorithm	13.5	9.0
SAR _{iso} [%] With Correction Algorithm	0.9	0.0

Sensor Offset

Probe Tip to Sensor Center **2.7 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 E²-field uncertainty inside TSL (see Page 8).

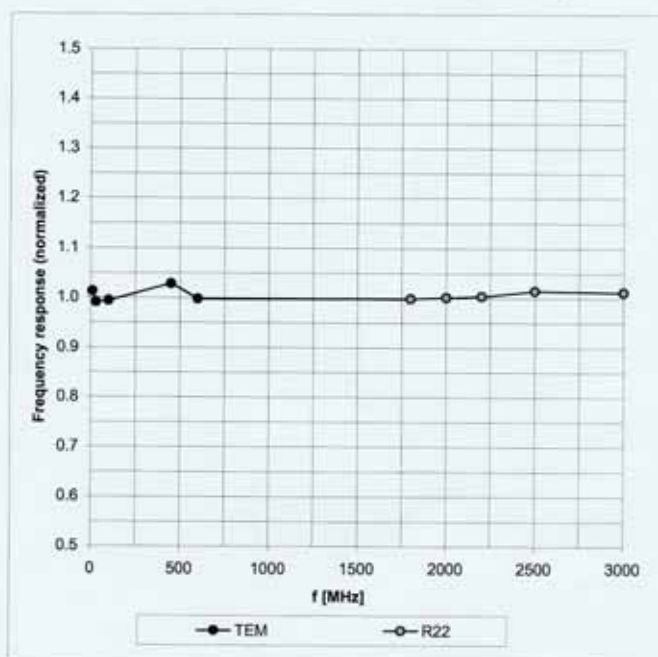
^B Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1531

November 19, 2004

Frequency Response of E-Field

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

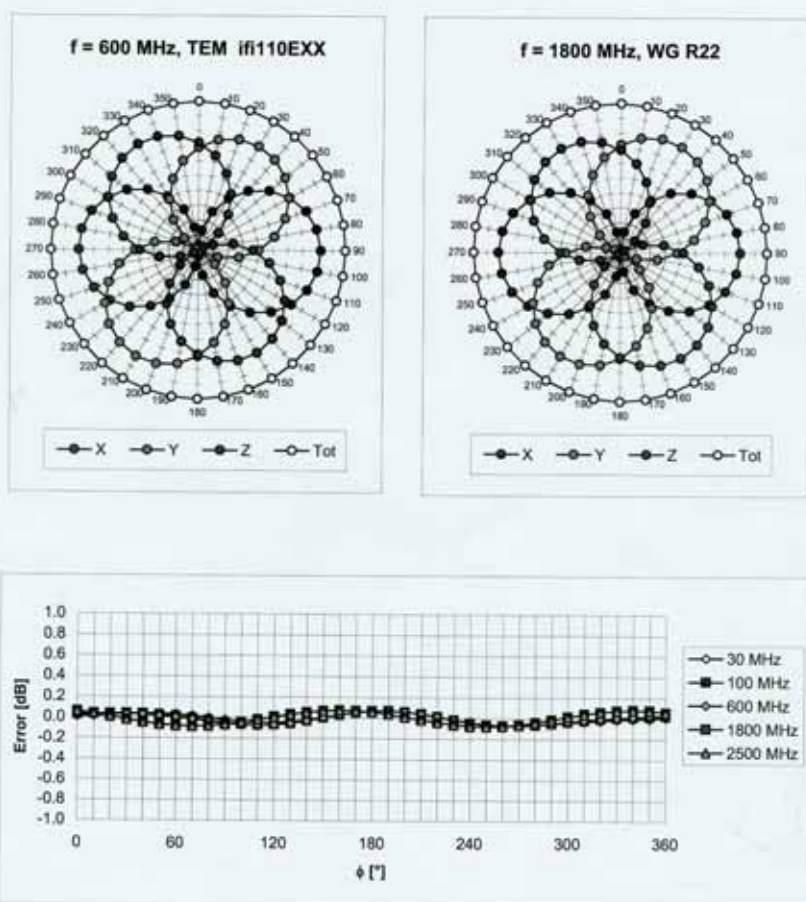


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ET3DV6 SN:1531

November 19, 2004

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



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

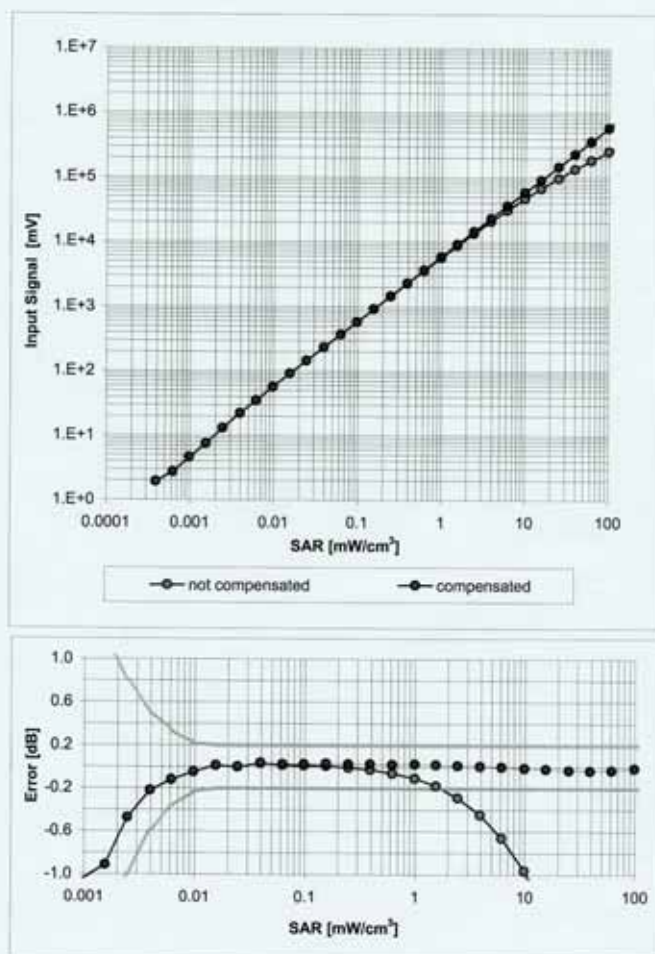
Certificate No: ET3-1531_Nov04

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ET3DV6 SN:1531

November 19, 2004

Dynamic Range f(SAR_{head})
(Waveguide R22, f = 1800 MHz)



Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

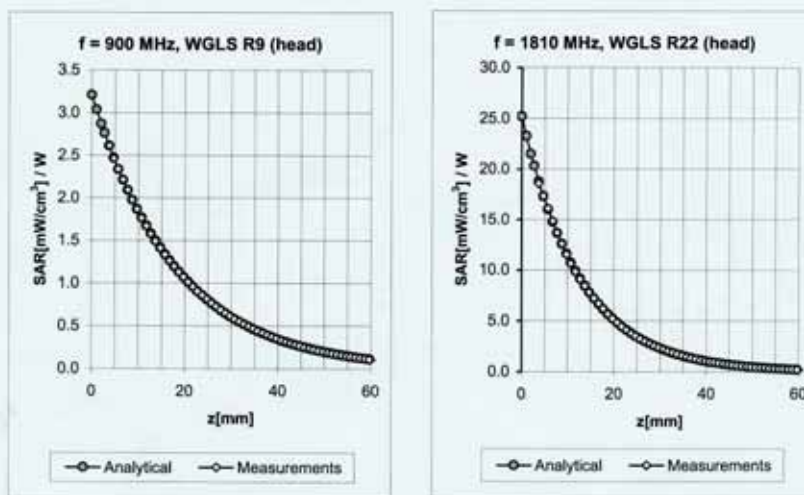
Certificate No: ET3-1531_Nov04

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ET3DV6 SN:1531

November 19, 2004

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.67	1.82	6.19 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.66	2.26	5.19 ± 11.0% (k=2)
2000	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.63	2.48	4.72 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.73	2.16	4.56 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.63	1.96	6.03 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.60	2.67	4.64 ± 11.0% (k=2)
2000	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.61	2.70	4.31 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.83	1.84	4.28 ± 11.8% (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.

Certificate No: ET3-1531_Nov04

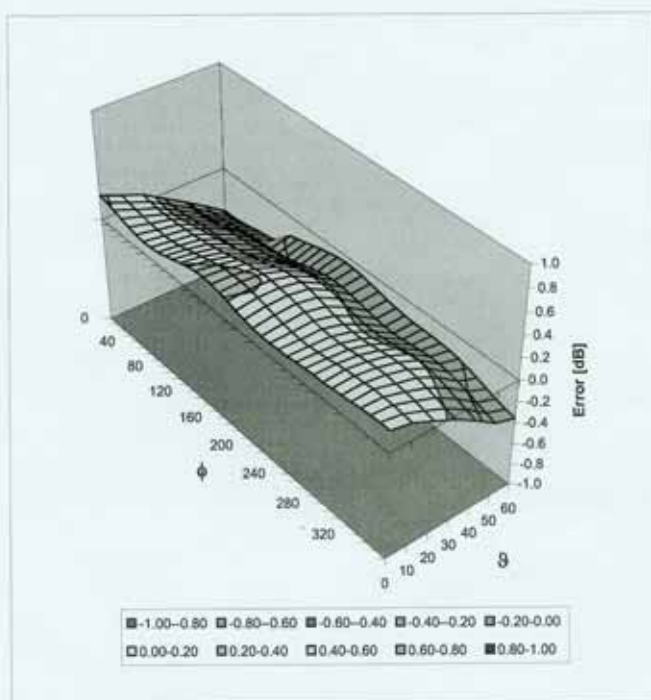
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ET3DV6 SN:1531

November 19, 2004

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

Certificate No: ET3-1531_Nov04

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Appendix E – Data Acquisition Electronic (DAE) Calibration

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 Federal Office of Metrology and Accreditation 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 Auden		Certificate No: DAE3-393_Apr05	
CALIBRATION CERTIFICATE			
Object	DAE3 - SD 000 D03 AA - SN: 393		
Calibration procedure(s)	QA CAL-06.v11 Calibration procedure for the data acquisition unit (DAE)		
Calibration date:	April 25, 2005		
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 (Calibrated by, Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295603	7-Sep-04 (Sintrel, No.E-040073)	Sep-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1002	16-Jul-04 (SPEAG, in house check)	In house check Jul-05
Calibrated by:	Name Daniel Steinacher	Function Technician	Signature 
Approved by:	Fin Bornholt	R&D Director	
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			Issued: April 25, 2005
Certificate No: DAE3-393_Apr05		Page 1 of 5	

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary

DAE digital acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- **DC Voltage Measurement:** Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- **Connector angle:** The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters contain technical information as a result from the performance test and require no uncertainty.
- **DC Voltage Measurement Linearity:** Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
- **Common mode sensitivity:** Influence of a positive or negative common mode voltage on the differential measurement.
- **Channel separation:** Influence of a voltage on the neighbor channels not subject to an input voltage.
- **AD Converter Values with inputs shorted:** Values on the internal AD converter corresponding to zero input voltage
- **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
- **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
- **Input resistance:** DAE input resistance at the connector, during internal auto-zeroing and during measurement.
- **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
- **Power consumption:** Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.034 $\pm$ 0.1% (k=2)	404.290 $\pm$ 0.1% (k=2)	404.188 $\pm$ 0.1% (k=2)
Low Range	3.97015 $\pm$ 0.7% (k=2)	3.95219 $\pm$ 0.7% (k=2)	3.95274 $\pm$ 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	18 $^{\circ}$ $\pm$ 1 $^{\circ}$
---	----------------------------------

Appendix

1. DC Voltage Linearity

High Range	Input (μV)	Reading (μV)	Error (%)
Channel X + Input	200000	200000.3	0.00
Channel X + Input	20000	19997.98	-0.01
Channel X - Input	20000	-19991.49	-0.04
Channel Y + Input	200000	199999.8	0.00
Channel Y + Input	20000	19995.58	-0.02
Channel Y - Input	20000	-19991.04	-0.04
Channel Z + Input	200000	200000.5	0.00
Channel Z + Input	20000	19996.71	-0.02
Channel Z - Input	20000	-20001.13	0.01

Low Range	Input (μV)	Reading (μV)	Error (%)
Channel X + Input	2000	1999.9	0.00
Channel X + Input	200	199.99	0.00
Channel X - Input	200	-200.44	0.22
Channel Y + Input	2000	1999.9	0.00
Channel Y + Input	200	199.28	-0.36
Channel Y - Input	200	-200.86	0.43
Channel Z + Input	2000	1999.9	0.00
Channel Z + Input	200	199.22	-0.39
Channel Z - Input	200	-201.08	0.54

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	12.51	11.50
	- 200	-10.12	-11.21
Channel Y	200	9.52	9.45
	- 200	-10.88	-11.19
Channel Z	200	3.35	2.94
	- 200	-4.99	-5.03

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	3.00	-0.31
Channel Y	200	1.48	-	5.95
Channel Z	200	-0.82	1.03	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16144	16008
Channel Y	16013	16872
Channel Z	16448	16957

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	1.00	0.39	2.17	0.24
Channel Y	-1.33	-2.17	-0.42	0.26
Channel Z	-0.62	-2.27	1.61	0.40

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.1999	200.6
Channel Y	0.2001	200.4
Channel Z	0.1999	200.1

8. Low Battery Alarm Voltage (verified during pre test)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (verified during pre test)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.0	+6	+14
Supply (- Vcc)	-0.01	-8	-9

10. Common Mode Bit Generation (verified during pre test)

Typical values	Bit set to High at Common Mode Error (V _{OC})
Channel X, Y, Z	+1.25