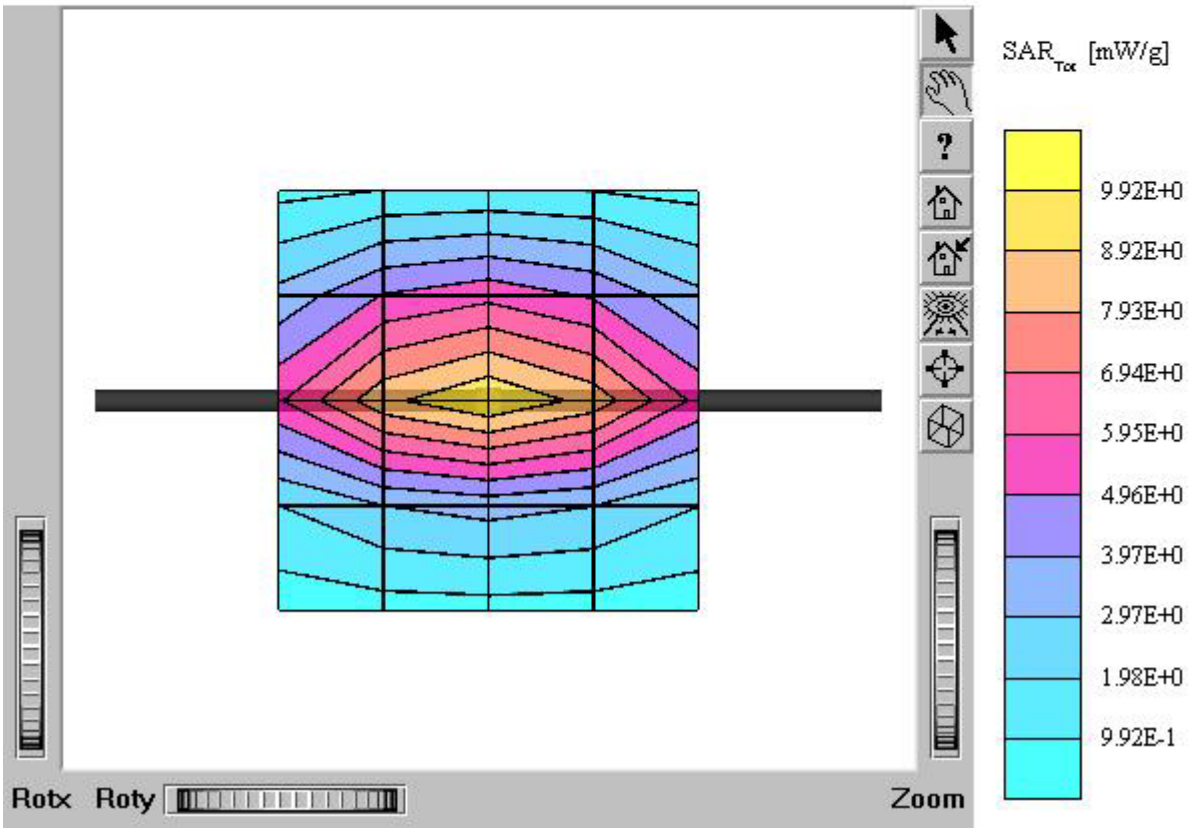
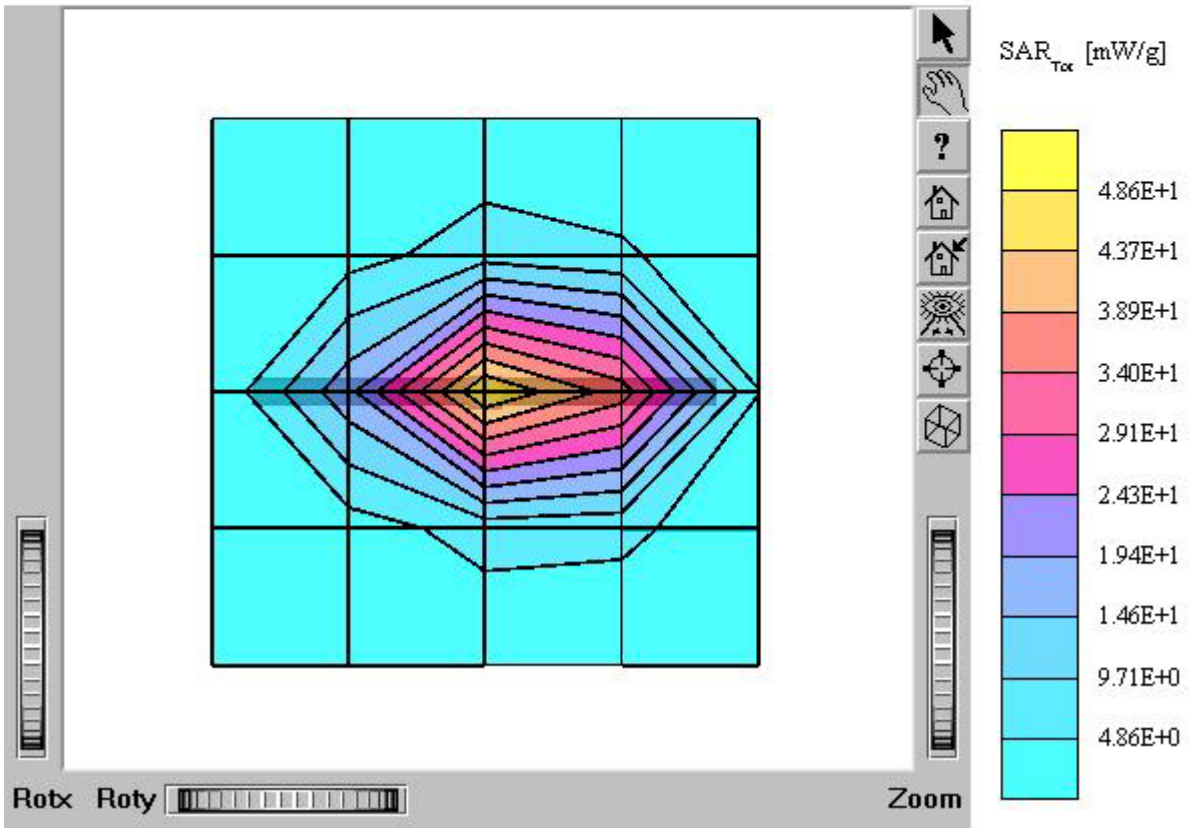
## ■ Validation Data (835MHz Brain)

Dipole 835 MHz
SAM I Phantom; Flat Section; Position: (90°,90°); Frequency: 835 MHz
Probe: ET3DV6 - SN1609; ConvF(6.63,6.63,6.63); Crest factor: 1.0; Brain 835 MHz: s = 0.88 mho/m $e_r$ = 42.4 r = 1.00 g/cm³
Cubes (2): SAR (1g): 10.1 mW/g ± 0.13 dB, SAR (10g): 6.50 mW/g ± 0.13 dB
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: 0.02 dB
Comment:
835MHz Brain Dipole Validation (D835V2/ S.N: 441)
Antenna Input Power: 30 dBm (1 W)
HCT Co., Ltd. Brain Tissue Simulating Liquid
Liquid Temperature: 21.4℃
Date Tested : November 25, 2004



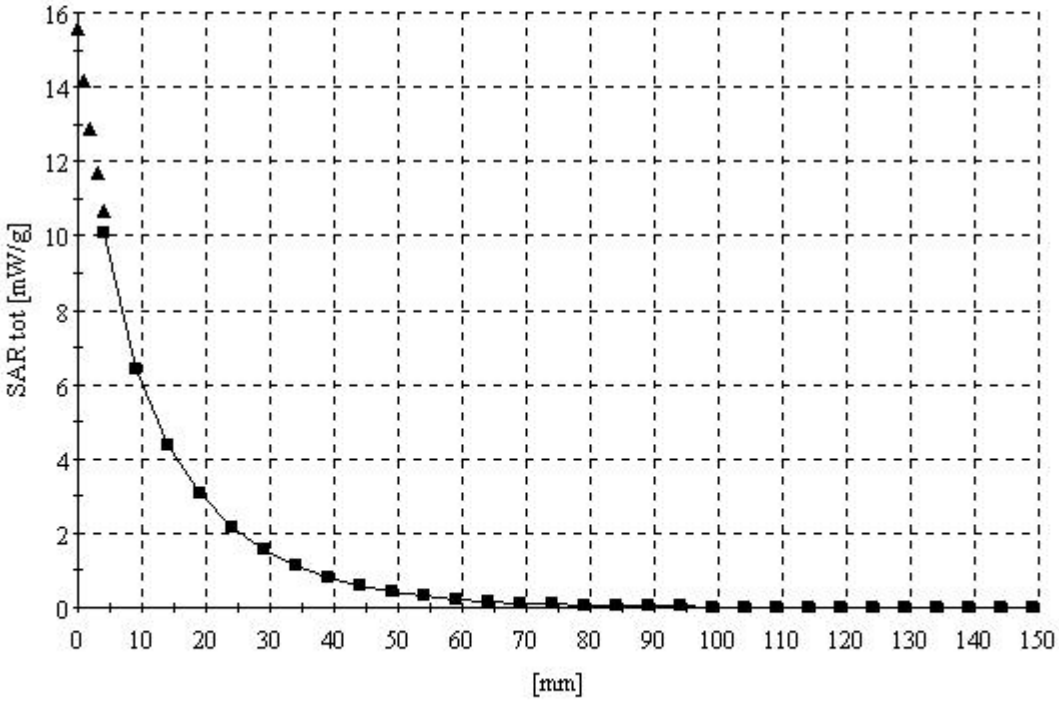
## ■ Validation Data (1900MHz Brain)

Dipole 1900 MHz
SAM II Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1609; ConvF(5.34,5.34,5.34); Crest factor: 1.0; Brain 1900 MHz: s = 1.41 mho/m $e_r$ = 39.5 r = 1.00 g/cm³
Cubes (2): SAR (1g): 43.2 mW/g ± 0.03 dB, SAR (10g): 22.0 mW/g ± 0.02 dB
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Powerdrift: 0.03 dB
Comment:
1900 MHz Brain Dipole Validation (D1900V2/ S.N: 5d032)
Antenna Input Power: 30 dBm (1 W)
HCT Co., Ltd. Brain Tissue Simulating Liquid
Liquid Temperature: 21.4℃
Date Tested : November 25, 2004



Dipole 835 MHz
SAM I Phantom; Section; Position: ; Frequency: 835 MHz
Probe: ET3DV6 - SN1609; ConvF(6.63,6.63,6.63); Crest factor: 1.0; Brain 835 MHz: s = 0.88 mho/m e, = 42.4 r = 1.00 g/cm³
:
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

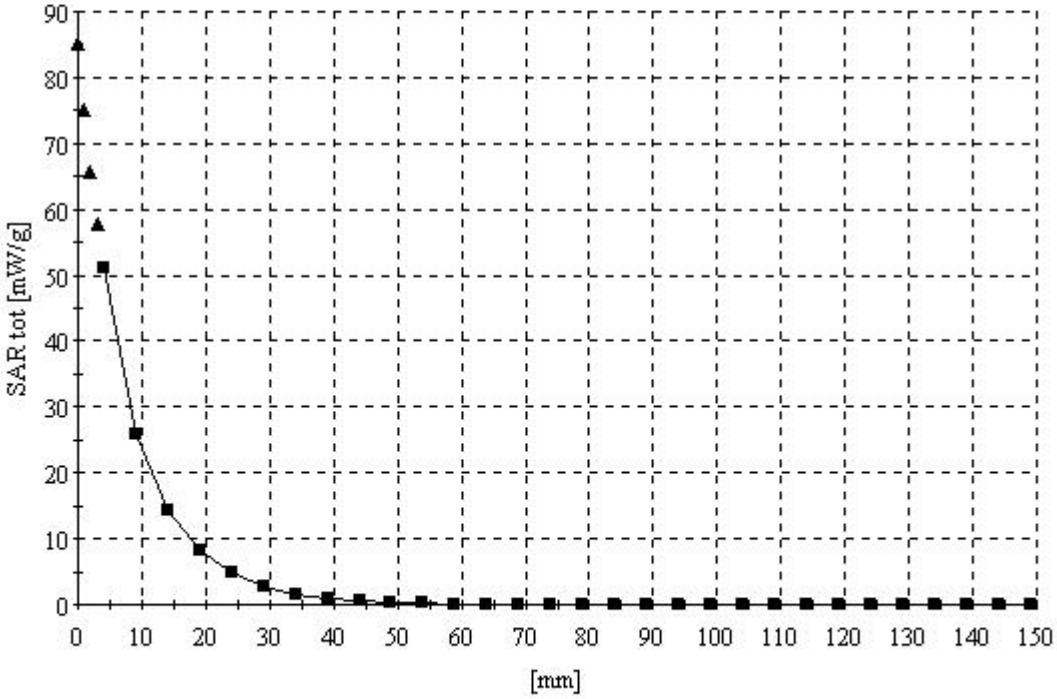
Comment:
835MHz Brain Dipole Validation (D835V2/ S.N: 441)
Antenna Input Power: 30 dBm (1 W)
HCT Co., Ltd. Brain Tissue Simulating Liquid
Liquid Temperature: 21.4℃
Date Tested : November 25, 2004



# Dipole 1900 MHz

SAM II Phantom; Section; Position: ; Frequency: 1900 MHz
Probe: ET3DV6 - SN1609; ConvF(5.34,5.34,5.34); Crest factor: 1.0; Brain 1900 MHz: s = 1.41 mho/m e, = 39.5 r = 1.00 g/cm³
:
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

Comment:
1900 MHz Brain Dipole Validation (D1900V2/ S.N: 5d032)
Antenna Input Power: 30 dBm (1 W)
HCT Co., Ltd. Brain Tissue Simulating Liquid
Liquid Temperature: 21.4℃
Date Tested : November 25, 2004



## ■ Dielectric Parameter (835MHz Brain)

Title : FLEX5000

SubTitle : GSM850 BRAIN

November 25, 2004 09:05 AM

| Frequency | e' | e'' |
|---|---|---|
| 800.000000 MHz | 42.9562 | 19.1080 |
| 805.000000 MHz | 42.8745 | 19.1105 |
| 810.000000 MHz | 42.7545 | 19.0484 |
| 815.000000 MHz | 42.6755 | 19.0510 |
| 820.000000 MHz | 42.6223 | 19.1213 |
| 825.000000 MHz | 42.5445 | 19.0811 |
| 830.000000 MHz | 42.4698 | 19.1040 |
| 835.000000 MHz | 42.3970 | 19.0739 |
| 840.000000 MHz | 42.3212 | 19.1393 |
| 845.000000 MHz | 42.3292 | 19.1281 |
| 850.000000 MHz | 42.2624 | 19.1800 |
| 855.000000 MHz | 42.2075 | 19.1972 |
| 860.000000 MHz | 42.1358 | 19.1884 |
| 865.000000 MHz | 42.0812 | 19.1645 |
| 870.000000 MHz | 42.0126 | 19.1249 |
| 875.000000 MHz | 41.9933 | 19.1117 |
| 880.000000 MHz | 41.9096 | 19.1178 |
| 885.000000 MHz | 41.8839 | 19.1119 |
| 890.000000 MHz | 41.8146 | 19.0590 |
| 895.000000 MHz | 41.7505 | 19.0202 |
| 900.000000 MHz | 41.7172 | 18.9825 |

## ■ Dielectric Parameter (1900MHz Brain)

Title : FLEX5000
SubTitle : GSM1900 BRAIN
November 26, 2004 03:14 PM

| Frequency | e' | e'' |
|---|---|---|
| 1.800000000 GHz | 39.8307 | 12.9397 |
| 1.806666667 GHz | 39.7757 | 12.9789 |
| 1.813333333 GHz | 39.7342 | 13.0341 |
| 1.820000000 GHz | 39.6972 | 13.1198 |
| 1.826666667 GHz | 39.6657 | 13.1689 |
| 1.833333333 GHz | 39.6892 | 13.2472 |
| 1.840000000 GHz | 39.7246 | 13.2997 |
| 1.846666667 GHz | 39.7392 | 13.3467 |
| 1.853333333 GHz | 39.7436 | 13.3908 |
| 1.860000000 GHz | 39.7710 | 13.4323 |
| 1.866666667 GHz | 39.7701 | 13.4613 |
| 1.873333333 GHz | 39.7496 | 13.4395 |
| 1.880000000 GHz | 39.7185 | 13.4665 |
| 1.886666667 GHz | 39.6623 | 13.4110 |
| 1.893333333 GHz | 39.5764 | 13.4018 |
| 1.900000000 GHz | 39.4755 | 13.3728 |
| 1.906666667 GHz | 39.3922 | 13.3658 |
| 1.913333333 GHz | 39.3015 | 13.3463 |
| 1.920000000 GHz | 39.2216 | 13.3794 |
| 1.926666667 GHz | 39.1626 | 13.3934 |
| 1.933333333 GHz | 39.0866 | 13.4304 |
| 1.940000000 GHz | 39.0533 | 13.4959 |
| 1.946666667 GHz | 38.9840 | 13.5319 |
| 1.953333333 GHz | 39.0075 | 13.6104 |
| 1.960000000 GHz | 39.0140 | 13.6617 |

## ■ Dielectric Parameter (835MHz Muscle)

Title : FLEX5000
SubTitle : GSM850 BODY
November 25, 2004 11:18 AM

| Frequency | e' | e'' |
|---|---|---|
| 800.000000 MHz | 53.7450 | 21.7890 |
| 805.000000 MHz | 53.6727 | 21.7542 |
| 810.000000 MHz | 53.7399 | 21.5351 |
| 815.000000 MHz | 53.7373 | 21.2188 |
| 820.000000 MHz | 53.6506 | 21.3597 |
| 825.000000 MHz | 53.5077 | 21.4308 |
| 830.000000 MHz | 53.4770 | 21.4062 |
| 835.000000 MHz | 53.4002 | 21.3433 |
| 840.000000 MHz | 53.3731 | 21.2632 |
| 845.000000 MHz | 53.3632 | 21.1993 |
| 850.000000 MHz | 53.3457 | 20.8778 |
| 855.000000 MHz | 53.2330 | 21.0917 |
| 860.000000 MHz | 52.9619 | 21.3955 |
| 865.000000 MHz | 52.9602 | 21.1685 |
| 870.000000 MHz | 52.8306 | 21.0873 |
| 875.000000 MHz | 52.8540 | 21.0564 |
| 880.000000 MHz | 52.9183 | 20.8670 |
| 885.000000 MHz | 52.9186 | 20.8451 |
| 890.000000 MHz | 52.6341 | 21.0525 |
| 895.000000 MHz | 52.6342 | 20.9677 |
| 900.000000 MHz | 52.5167 | 20.9287 |

## ■ Dielectric Parameter (1900MHz Muscle)

Title : FLEX5000
SubTitle : GSM1900 BODY
November 26, 2004 05:59 PM

| Frequency | e' | e'' |
|---|---|---|
| 1.800000000 GHz | 51.6004 | 13.0700 |
| 1.806666667 GHz | 51.6033 | 13.0847 |
| 1.813333333 GHz | 51.6290 | 13.1753 |
| 1.820000000 GHz | 51.6194 | 13.2356 |
| 1.826666667 GHz | 51.6166 | 13.3148 |
| 1.833333333 GHz | 51.5030 | 13.3333 |
| 1.840000000 GHz | 51.4566 | 13.3794 |
| 1.846666667 GHz | 51.4984 | 13.4204 |
| 1.853333333 GHz | 51.4700 | 13.5219 |
| 1.860000000 GHz | 51.4385 | 13.5695 |
| 1.866666667 GHz | 51.3838 | 13.6905 |
| 1.873333333 GHz | 51.3522 | 13.7597 |
| 1.880000000 GHz | 51.3197 | 13.8263 |
| 1.886666667 GHz | 51.3133 | 13.8773 |
| 1.893333333 GHz | 51.3046 | 13.9444 |
| 1.900000000 GHz | 51.3030 | 14.0264 |
| 1.906666667 GHz | 51.3114 | 14.1420 |
| 1.913333333 GHz | 51.2801 | 14.2117 |
| 1.920000000 GHz | 51.2083 | 14.2187 |
| 1.926666667 GHz | 51.2535 | 14.2766 |
| 1.933333333 GHz | 51.2469 | 14.3386 |
| 1.940000000 GHz | 51.1919 | 14.3772 |
| 1.946666667 GHz | 51.2165 | 14.4712 |
| 1.953333333 GHz | 51.1286 | 14.4870 |
| 1.960000000 GHz | 51.0683 | 14.4853 |

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

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**Accreditation No.: SCS 108**

**Client** H-CT (Dymstec)

**Certificate No: D835V2-441_Sep04**

# CALIBRATION CERTIFICATE

Object D835V2 - SN: 441

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

Calibration date: September 16, 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 sensor HP 8481A | US37292783 | 5-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| 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 | 23-Jan-04 (SPEAG, No. ET3-1507_Jan04) | Jan-05 |
| DAE4 | SN 601 | 6-Nov-03 (SPEAG, No. DAE4-601_Jul04) | Jul-05 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | GB43310788 | 13-Aug-03 (SPEAG, in house check Jan-04) | In house check: Jan-06 |
| 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-03) | In house check: Nov 04 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Judith Mueller | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: September 24, 2004

**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
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 |
| ConF | sensitivity in TSL / NORM x,y,z |
| N/A | not applicable or not measured |

**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) 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
c) 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:**

d) 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 | V4.3 |
| **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** | 835 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 41.8 ± 6 % | 0.92 mho/m ± 6 % |
| **Head TSL temperature during test** | (21.2 ± 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 | 2.54 mW / g |
| SAR normalized | normalized to 1W | 10.2 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **10.2 mW / g ± 17.0 % (k=2)** |

| **SAR averaged over 10 cm$^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 1.65 mW / g |
| SAR normalized | normalized to 1W | 6.60 mW / g |
| SAR for nominal Head TSL parameters [1] | normalized to 1W | **6.63 mW / g ± 16.5 % (k=2)** |

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



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## Appendix

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 51.6 Ω - 6.8 jΩ |
| Return Loss | 23.3 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.375 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 | March 9, 2001 |

## DASY4 Validation Report for Head TSL

Date/Time: 09/16/04 14:52:29

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN441**

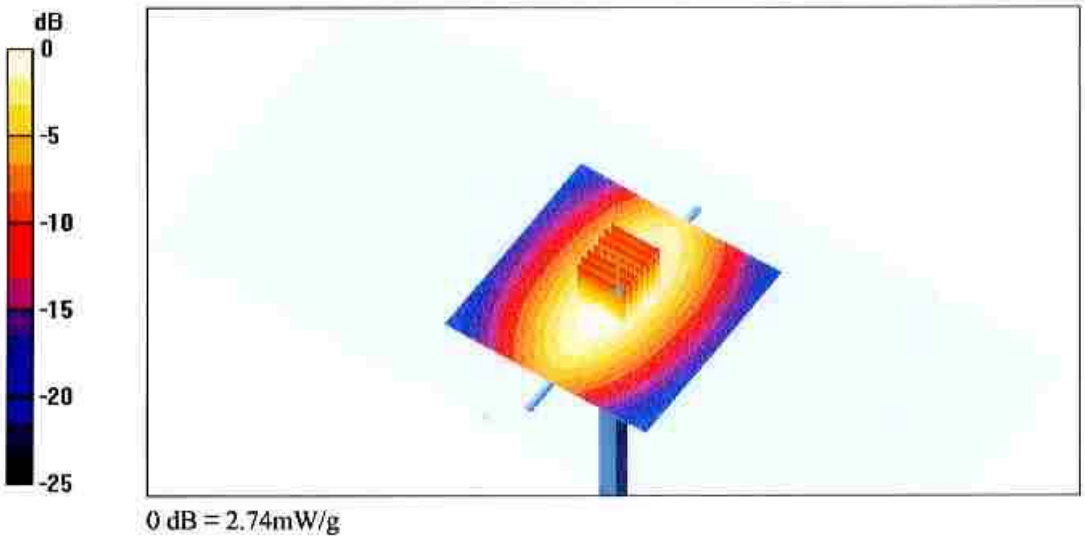
Communication System: CW-835; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL 835 MHz;
Medium parameters used: f = 835 MHz; $\sigma$ = 0.92 mho/m; $\varepsilon_r$ = 41.5; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.3, 6.3, 6.3); Calibrated: 23.01.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 22.07.2004
- Phantom: Flat Phantom half size; Type: QD000P49AA; Serial: SN:1001;
- Measurement SW: DASY4, V4.3 Build 20; Postprocessing SW: SEMCAD, V1.8 Build 126

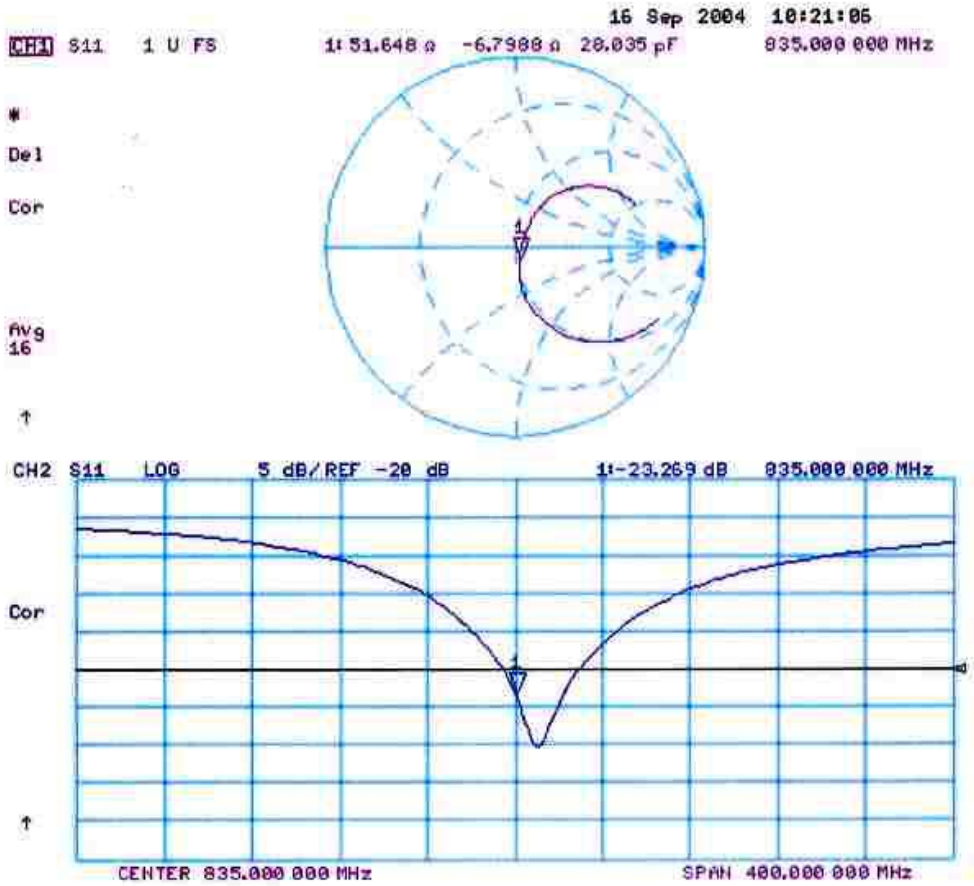
**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.74 mW/g

**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.4 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 3.78 W/kg
**SAR(1 g) = 2.54 mW/g; SAR(10 g) = 1.65 mW/g**
Maximum value of SAR (measured) = 2.74 mW/g




0 dB = 2.74mW/g

## Impedance Measurement Plot for Head TSL



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Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

**Client** **H-CT (Dymstec)**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object(s) | D1900V2 - SN:5d032 |
| Calibration procedure(s) | QA CAL-05.v2<br>Calibration procedure for dipole validation kits |
| Calibration date: | April 26, 2004 |
| Condition of the calibrated item | In Tolerance (according to the specific calibration document) |

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

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

| Model Type | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM E442 | GB37480704 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | US37292783 | 6-Nov-03 (METAS, No. 252-0254) | Nov-04 |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (Agilent, No. 20021018) | Oct-04 |
| RF generator R&S SML-03 | 100698 | 27-Mar-2002 (R&S, No. 20-92389) | In house check: Mar-05 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (SPEAG, in house check Nov-03) | In house check: Oct 05 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Judith Mueller | Technician | |
| Approved by: | Katja Pokovic | Laboratory Director | |

Date issued: April 27, 2004

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

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info@speag.com, http://www.speag.com

# DASY

## Dipole Validation Kit

## Type: D1900V2

## Serial: 5d032

Manufactured: March 17, 2003
Calibrated: April 26, 2004

## 1. Measurement Conditions

The measurements were performed in the flat section of the SAM twin phantom filled with **head simulating solution** of the following electrical parameters at 1900 MHz:

| | | |
|---|---|---|
| Relative Dielectricity | **40.1** | ± 5% |
| Conductivity | **1.45 mho/m** | ± 5% |

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 4.96 at 1900 MHz) was used for the measurements.

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

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.
The dipole input power (forward power) was 250 mW ± 3 %. The results are normalized to 1W input power.

## 2. SAR Measurement with DASY4 System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

| | |
|---|---|
| averaged over 1 $cm^3$ (1 g) of tissue: | **40.0 mW/g** ± 16.8 % (k=2)[1] |
| averaged over 10 $cm^3$ (10 g) of tissue: | **21.0 mW/g** ± 16.2 % (k=2)[1] |

[1] validation uncertainty

## 3. Dipole Impedance and Return Loss

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

| | | |
|---|---|---|
| Electrical delay: | **1.192 ns** | (one direction) |
| Transmission factor: | **0.999** | (voltage transmission, one direction) |

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

| | |
|---|---|
| Feedpoint impedance at 1900 MHz: | Re{Z} = **49.8 Ω** |
| | Im {Z} = **3.4 Ω** |
| Return Loss at 1900 MHz | **-29.5 dB** |

## 4. Handling

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

## 5. Design

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

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

## 6. Power Test

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

Date/Time: 04/26/04 13:04:32

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN5d032**

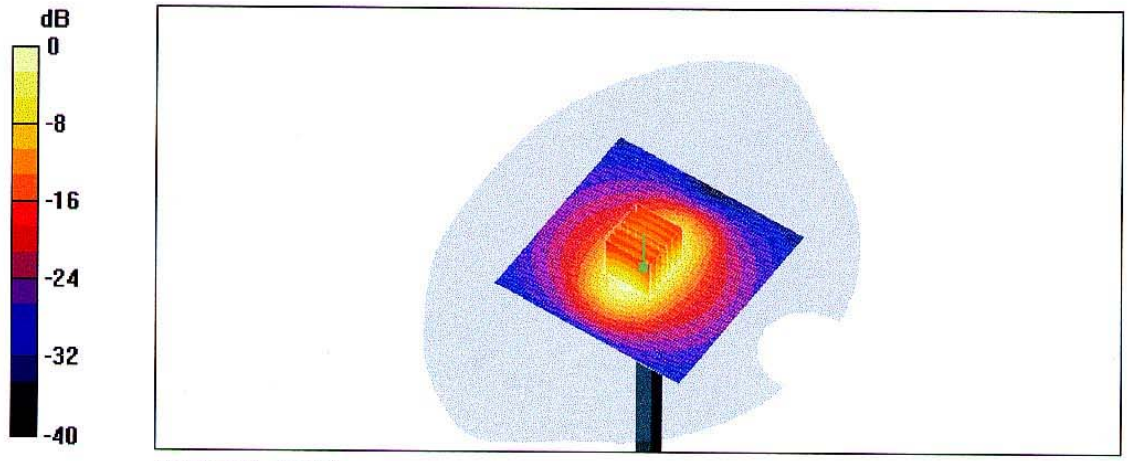
Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 MHz;
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.45 mho/m; $\varepsilon_r$ = 40.1; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 112

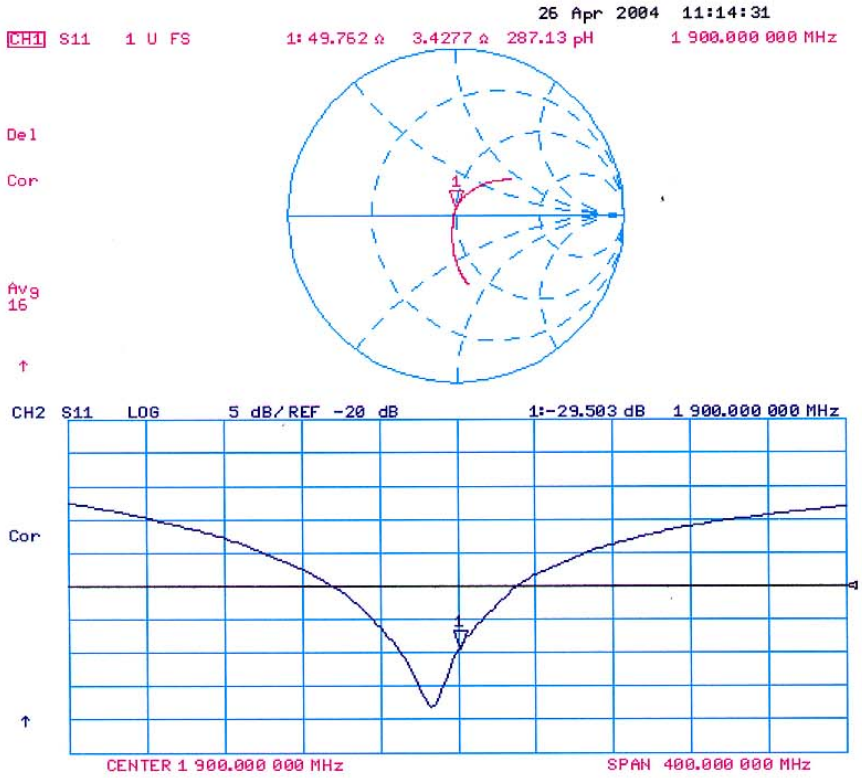
**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm
Reference Value = 92 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 11.4 mW/g

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 11.2 mW/g
Peak SAR (extrapolated) = 17.8 W/kg
**SAR(1 g) = 10 mW/g; SAR(10 g) = 5.25 mW/g**




0 dB = 11.2mW/g

5d032


26 Apr 2004 11:14:31
CH1 S11 1 U FS
1: 49.762 Ω 3.4277 Ω 287.13 pH
1 900.000 000 MHz
Del
Cor
Avg
16
CH2 S11 LOG
5 dB/ REF -20 dB
1:-29.503 dB 1 900.000 000 MHz
Cor
CENTER 1 900.000 000 MHz
SPAN 400.000 000 MHz