Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland

Client CCS

Object(s)	D900V2 - SN 108		
Calibration procedure(s)	QA CAL-05:v2 Calibration proced	dure for dipole validation kit	S
Calibration date:	April 10, 2003		
Condition of the calibrated item	In Tolerance (acc	ording to the specific calibra	ation document)
	and in the close of letter 1.		O. 15
All calibrations have been condu	•	cility: environment temperature 22 +/- 2 de	egrees Celsius and humidity < 75%.
∖ll calibrations have been condu Calibration Equipment used (M& Aodel Type	TE critical for calibration)	Cal Date	egrees Celsius and humidity < 75%. Scheduled Calibration
All calibrations have been condu Calibration Equipment used (M& Model Type RF generator R&S SML-03	TE critical for calibration) ID # 100698	Cal Date 27-Mar-2002	Scheduled Calibration In house check: Mar-05
All calibrations have been conductalibration Equipment used (M& Model Type RF generator R&S SML-03 Power sensor HP 8481A	TE critical for calibration) ID # 100698 MY41092317	Cal Date 27-Mar-2002 18-Oct-02	Scheduled Calibration In house check: Mar-05 Oct-04
All calibrations have been conductalibration Equipment used (M& Model Type RF generator R&S SML-03 Power sensor HP 8481A Power sensor HP 8481A	TE critical for calibration) ID # 100698 MY41092317 US37292783	Cal Date 27-Mar-2002 18-Oct-02 30-Oct-02	Scheduled Calibration In house check: Mar-05 Oct-04 Oct-03
All calibrations have been condu Calibration Equipment used (M& Model Type RF generator R&S SML-03 Power sensor HP 8481A Power sensor HP 8481A Power meter EPM E442	TE critical for calibration) ID # 100698 MY41092317	Cal Date 27-Mar-2002 18-Oct-02	Scheduled Calibration In house check: Mar-05 Oct-04
All calibrations have been condu- Calibration Equipment used (M& Model Type RF generator R&S SML-03 Power sensor HP 8481A Power sensor HP 8481A Power meter EPM E442	TE critical for calibration) ID # 100698 MY41092317 US37292783 GB37480704	Cal Date 27-Mar-2002 18-Oct-02 30-Oct-02 30-Oct-02	Scheduled Calibration In house check: Mar-05 Oct-04 Oct-03 Oct-03
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All calibrations have been conductalibration Equipment used (M& Model Type RF generator R&S SML-03 Power sensor HP 8481A Power sensor HP 8481A Power meter EPM E442 Network Analyzer HP 8753E	TE critical for calibration) ID # 100698 MY41092317 US37292783 GB37480704 US38432426	Cal Date 27-Mar-2002 18-Oct-02 30-Oct-02 30-Oct-02 3-May-00	Scheduled Calibration In house check: Mar-05 Oct-04 Oct-03 Oct-03 In house check: May 03
17025 international standard. All calibrations have been conducted in the conducted in the case of the	TE critical for calibration) ID # 100698 MY41092317 US37292783 GB37480704 US38432426 Name	Cal Date 27-Mar-2002 18-Oct-02 30-Oct-02 3-May-00 Function	Scheduled Calibration In house check: Mar-05 Oct-04 Oct-03 Oct-03 In house check: May 03

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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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DASY

Dipole Validation Kit

Type: D900V2

Serial: 108

Manufactured: March 9, 2001 Calibrated: April 10, 2003

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 900 MHz:

Relative Dielectricity 42.1 $\pm 5\%$ Conductivity 0.95 mho/m $\pm 5\%$

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 6.6 at 900 MHz) was used for the measurements.

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

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

The dipole input power (forward power) was $250 \text{mW} \pm 3 \%$. The results are normalized to 1W input power.

2. SAR Measurement with DASY4 System

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

averaged over 1 cm 3 (1 g) of tissue: 10.5 mW/g \pm 16.8 % (k=2) 1

averaged over 10 cm³ (10 g) of tissue: **6.76 mW/g** \pm 16.2 % (k=2)¹

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: 1.396 ns (one direction)

Transmission factor: 0.991 (voltage transmission, one direction)

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

Feedpoint impedance at 900 MHz: $Re\{Z\} = 51.9 \Omega$

 $Im \{Z\} = -3.1 \Omega$

Return Loss at 900 MHz -28.9 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.

6. Power Test

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

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