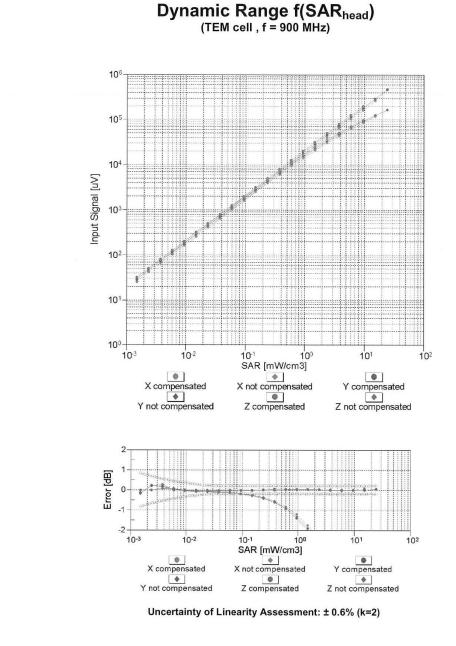
Page 52 of 66

ET3DV6- SN:1380

December 12, 2011

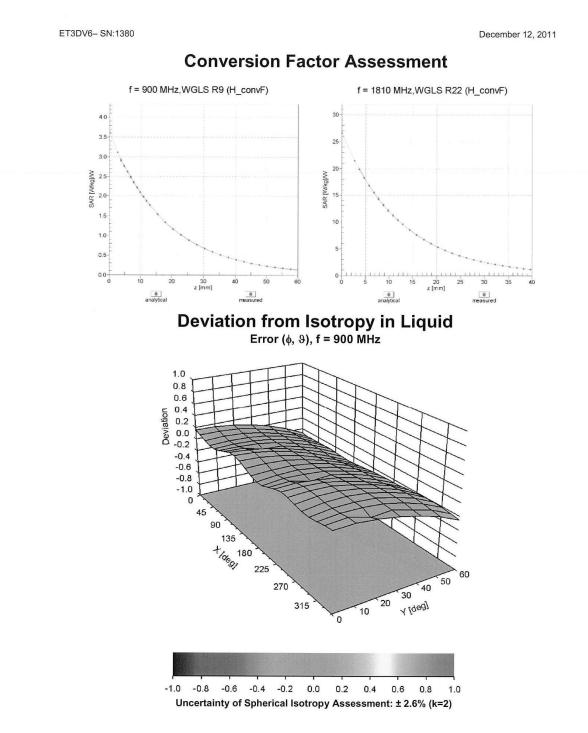


Certificate No: ET3-1380_Dec11

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Certificate No: ET3-1380_Dec11

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ET3DV6- SN:1380

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1380

Other Probe Parameters

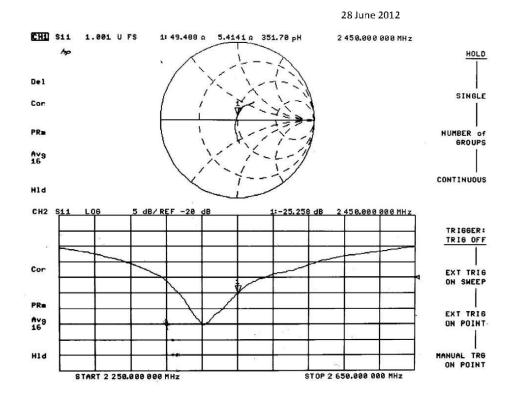
Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

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Calibration Laboratory of Schmidt & Partner Engineering AG enginuaustasse 43, 6004 Zurich, Switzerland Image: Comparison of Calibration Service Schwidzerland Service Schwidze				
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates Calibration Exception of calibration certificates Calibration CERTIFICATE Object D2450V2 - SN: 724 Calibration procedure(s) QA CAL-05.v7 Calibration procedure for dipole validation kits Calibration date: December 09, 2010 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertaintees 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 D # New sensor HP 8481A U337292783 U337292783 06-Oct-10 (No. 217-01168) Mar-11 Power sensor HP 8481A U337292783 06-Oct-10 (No. 217-01168) Mar-11 SN: 5047.2 / 06327 30-Mar-10 (No. 217-01168)	Schmid & Partner Engineering AG			Service suisse d'étalonnage Servizio svizzero di taratura
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Object D2450V2 - SN: 724 Calibration procedure(s) QA CAL-05.v7 Calibration procedure for dipole validation kits Calibration date: December 09, 2010 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibration Equipment used (M&TE critical for calibration) Primary Standards ID # Cal Date (Certificate No.) Schedule Calibration Oct-11 Power meter EPM-442A GB37480704 06-Oct-10 (No. 217-01266) Oct-11 Power meter EPM-442A GB37480704 06-Oct-10 (No. 217-01266) Oct-11 Power meter EPM-442A GB37480704 06-Oct-10 (No. 217-01266) Oct-11 Power meter EPM-442A GB37480704 06-Oct-10 (No. 217-01122) Mar-11 Reference 20 dB Attenuator SN: 5066 (20g) 30-Mar-10 (No. 217-01122) Mar-11 SN: 601 10-Jun-10 (No. DAE4-601_Jun10) Jun-11 SN: 601 10-Jun-10 (No. DAE4-601_Jun10) Jun-11 SN: 601 10-Jun-10 (No. DAE4-601_Jun10) Jun-11 SN: 5065 S4208 <td< th=""><th>Ellient EMC Technolo</th><th>gies</th><th>Certificate</th><th>No: D2450V2-724_Dec10</th></td<>	Ellient EMC Technolo	gies	Certificate	No: D2450V2-724_Dec10
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Power meter EPM-442A GB37480704 06-Oct-10 (No. 217-01266) Oct-11 Power sensor HP 8481A US37292783 06-Oct-10 (No. 217-01266) Oct-11 Reference 20 dB Attenuator SN: 5086 (20g) 30-Mar-10 (No. 217-01158) Mar-11 Type-N mismatch combination SN: 5047.2 / 06327 30-Mar-10 (No. 217-01162) Mar-11 Reference Probe ES3DV3 SN: 3205 30-Apr-10 (No. ES3-3205_Apr10) Apr-11 DAE4 SN: 601 10-Jun-10 (No. DAE4-601_Jun10) Jun-11 Secondary Standards ID # Check Date (in house) Scheduled Check Power sensor HP 8481A MY41092317 18-Oct-02 (in house check Oct-09) In house check: Oct-11 RF generator R&S SMT-06 10005 4-Aug-99 (in house check Oct-09) In house check: Oct-11 Network Analyzer HP 8753E US37390585 S4206 18-Oct-01 (in house check Oct-10) In house check: Oct-11 Calibrated by: Name Function Signature Dimce Iliev Laboratory Technician D D	The measurements and the unce	rtainties with confidence p	robability are given on the following pages	and are part of the certificate.
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Power sensor HP 8481A Reference 20 dB AttenuatorUS37292783 SN: 5086 (20g)06-Oct-10 (No. 217-01266) SN: 5086 (20g)Oct-11 Mar-11Type-N mismatch combination Reference Probe ES3DV3 DAE4SN: 5047.2 / 06327 SN: 3205 SO-Apr-10 (No. 217-01162)Mar-11 Mar-11Secondary StandardsID # Check Date (in house)Scheduled CheckPower sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Ustwork Analyzer HP 8753EID # US37390585 S4206Check Date (in house check Oct-09) Is Nouse check Oct-09)In house check: Oct-11 In house check: Oct-11 In house check: Oct-11Calibrated by:NameFunction Laboratory TechnicianSignature Dimce llievDimce llievLaboratory TechnicianDimce	The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&1	rtainties with confidence p cted in the closed laborator TE critical for calibration)	robability are given on the following pages r	and are part of the certificate.)°C and humidity < 70%.
Type-N mismatch combination SN: 5047.2 / 06327 30-Mar-10 (No. 217-01162) Mar-11 Reference Probe ES3DV3 SN: 3205 30-Apr-10 (No. ES3-3205_Apr10) Apr-11 DAE4 SN: 601 10-Jun-10 (No. DAE4-601_Jun10) Jun-11 Secondary Standards ID # Check Date (in house) Scheduled Check Power sensor HP 8481A MY41092317 18-Oct-02 (in house check Oct-09) In house check: Oct-11 RF generator R&S SMT-06 US37390585 S4206 18-Oct-01 (in house check Oct-09) In house check: Oct-11 Vetwork Analyzer HP 8753E Name Function Signature Dalibrated by: Dimce Iliev Laboratory Technician Dimce	The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards	rtainties with confidence p cted in the closed laborator IE critical for calibration)	robability are given on the following pages or y facility: environment temperature (22 ± 3 Cal Date (Certificate No.)	and are part of the certificate.)°C and humidity < 70%. Scheduled Calibration
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Certificate No: D2450V2-724_Dec10

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





S Schweizerischer Kalibrierdienst

- C Service suisse d'étalonnage
- Servizio svizzero di taratura
- Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

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:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- 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) DASY4/5 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.

Certificate No: D2450V2-724_Dec10

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Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.3 ± 6 %	1.91 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 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	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	52.3 mW / g ± 17.0 % (k=2)

SAR averaged over 10 $\rm cm^3$ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.04 mW / g
SAR normalized	normalized to 1W	24.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	24.2 mW / g ± 16.5 % (k=2)

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Appendix

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω + 4.3 jΩ
Return Loss	- 26.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.152 ns
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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		

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Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurement included in this document are traceable to Australian/national standards. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

DASY5 Validation Report for Body

Date/Time: 09.12.2010 13:23:23

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:724

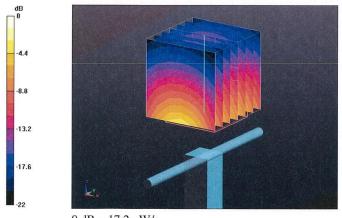
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: MSL U12 BB Medium parameters used: f = 2450 MHz; σ = 1.92 mho/m; ϵ_r = 52.5; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 97.3 V/m; Power Drift = -0.059 dB Peak SAR (extrapolated) = 27.3 W/kg SAR(1 g) = 13 mW/g; SAR(10 g) = 6.04 mW/g

Maximum value of SAR (measured) = 17.2 mW/g



 $0 \, dB = 17.2 \, mW/g$

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