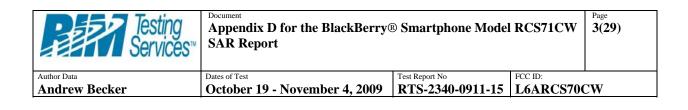


APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

Testing Services™	Document Appendix D for the BlackBerry SAR Report	RCS71CW ^{Page} 2(29)	
Author Data	Dates of Test	Test Report No	FCC ID:
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS70CW
Calibration Lab Schmid & Partne	iloc and	Service suisse	
Engineering Ad Zeughausstrasse 43, 80	G Hac-MRA	S Swiss Calibrati	

Accreditation No.: SCS 108

unsieteren zigreennent fer un	ccredited by the Swiss Accreditation Service (SAS) he Swiss Accreditation Service is one of the signatories to the EA ultilateral Agreement for the recognition of calibration certificates		Accreditation No.: SCS 108		
lient RTS (RIM Tet	RTS (RIM Testing Services)		o: ET3-1642_Jan09		
ALIBRATION	CERTIFICAT	E			
Dbject	ET3DV6 - SN:1	642			
Calibration procedure(s)	NORTH THE REPORT OF THE REPORT	and QA CAL-23.v3 edure for dosimetric E-field probe	S		
Calibration date:	January 12, 200	99	College States and State		
Condition of the calibrated item	In Tolerance	anenga an			
The measurements and the un	certainties with confidence	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)*0	d are part of the certificate.		
Calibration Equipment used (M	I&TE critical for calibration)				
Calibration Equipment used (M Primary Standards		Cal Date (Certificate No.)	Scheduled Calibration		
Calibration Equipment used (N Primary Standards Power meter E4419B	I&TE critical for calibration)	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788)	Scheduled Calibration		
Calibration Equipment used (N Inimary Standards Iower meter E4419B Iower sensor E4412A	IBTE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration Apr-09		
Calibration Equipment used (M Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A	I&TE critical for calibration)	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788)	Scheduled Calibration Apr-09 Apr-09		
Calibration Equipment used (M Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41498087	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788)	Scheduled Calibration Apr-09 Apr-09 Apr-09		
Calibration Equipment used (M Primary Standards Power moter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41495087 SN: 85054 (3c)	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00865)	Scheduled Calibration Apr-09 Apr-09 Apr-09 Jul-09 Jul-09		
Calibration Equipment used (N Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41495087 SN: S5054 (3c) SN: S5056 (20b)	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00855) 31-Mar-08 (No. 217-00787)	Scheduled Calibration Apr-09 Apr-09 Apr-09 Jul-09 Apr-09		
Calibration Equipment used (M Primary Standards Nower meter E44198 Nower sensor E4412A Nower sensor E4412A Telefence 3 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2	18.TE critical for calibration) ID # GB41293874 MY41495277 MY41498087 SN: 85054 (3c) SN: 85066 (3cb) SN: 85129 (30b)	Cal Date (Certificate No.) 1-Apr-06 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-09 (No. 217-00865) 31-Mar-08 (No. 217-00865) 1-Jul-08 (No. 217-00866)	Scheduled Calibration Apr-09 Apr-09 Jul-09 Apr-09 Jul-09 Jul-09		
Calibration Equipment used (M Primary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A Reference 30 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41496067 SN: 55056 (20b) SN: 55129 (30b) SN: 3013	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00865) 31-Mar-08 (No. 217-00787) 1-Jul-08 (No. 217-00866) 2-Jan-09 (No. ES3-3013_Jan09)	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jul-09 Jan-10		
Calibration Equipment used (N Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 20 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41496087 SN: 85054 (3c) SN: 85056 (20b) SN: 85129 (30b) SN: 3013 SN: 660	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00786) 1-Jul-08 (No. 217-00865) 31-Mar-08 (No. 217-00866) 2-Jan-09 (No. ES3-3013_Jan09) 9-Sep-08 (No. DAE4-660_Sep08)	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jul-09 Jan-10 Sep-09		
Calibration Equipment used (M Primary Standards *ower meter E44198 Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 90 dB Attenuator Reference Probe E53DV2 JAE4 Secondary Standards RF generator HP 8648C	18.TE critical for calibration) ID # GB41293874 MY41495277 MY41498087 SN: 85054 (3c) SN: 85056 (3cb) SN: 85066 (3cb) SN: 85129 (30b) SN: 3013 SN: 660 ID #	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00785) 31-Mar-08 (No. 217-00787) 1-Jul-08 (No. 217-00866) 2-Jan-09 (No. ES3-3013_Jan09) 9-Sep-08 (No. DAE4-660_Sep08) Check Date (in house)	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jan-10 Sep-09 Scheduled Check		
Calibration Equipment used (M Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 20 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C	I&TE critical for calibration) ID # GB41293874 MY41495277 MY4149607 SN: \$5054 (3c) SN: \$5066 (20b) SN: \$5129 (30b) SN: 3013 SN: 660 ID # US3842U01700	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00786) 1-Jul-08 (No. 217-00787) 1-Jul-08 (No. 217-00866) 2-Jan-09 (No. ES3-3013_Jan09) 9-Sep-08 (No. DAE4-660_Sep08) Check Date (in house) 4-Aug-99 (in house check Oct-07) 18-Oct-01 (in house check Oct-08) Function	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jul-09 Jan-10 Sep-09 Scheduled Check In house check: Ocl-09		
Calibration Equipment used (M Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference 90 dB Attenuator Reference 91 dB Attenua	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41496067 SN: 55054 (3c) SN: 55129 (30b) SN: 55129 (30b) S	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00788) 1-Jul-08 (No. 217-00787) 1-Jul-08 (No. 217-00787) 1-Jul-08 (No. 217-00787) 1-Jul-08 (No. 217-00866) 2-Jan-08 (No. 217-00866) 2-Jan-09 (No. 253-013,Jan09) 9-Sep-08 (No. DAE4-660_Sep08) Check Date (in house) 4-Aug-99 (in house check Oct-07) 18-Oct-01 (in house check Oct-08)	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jan-10 Sep-09 Scheduled Check In house check: Oct-09 In house check: Oct-09		
Calibration Equipment used (M Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	I&TE critical for calibration) ID # GB41293874 MY41495277 MY41495077 MY41496067 SN: 85054 (3c) SN: 85054 (3c) SN: 85056 (20b) SN: 85129 (30b) SN: 3013 SN: 660 ID # US3642U01700 US37390585 Name	Cal Date (Certificate No.) 1-Apr-08 (No. 217-00788) 1-Apr-08 (No. 217-00788) 1-Jul-08 (No. 217-00786) 1-Jul-08 (No. 217-00787) 1-Jul-08 (No. 217-00866) 2-Jan-09 (No. ES3-3013_Jan09) 9-Sep-08 (No. DAE4-660_Sep08) Check Date (in house) 4-Aug-99 (in house check Oct-07) 18-Oct-01 (in house check Oct-08) Function	Scheduled Calibration Apr-09 Apr-09 Jul-09 Jul-09 Jul-09 Jan-10 Sep-09 Scheduled Check In house check: Oct-09 In house check: Oct-09		



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



Schweizerischer Kalibrierdienst S

Service suisse d'étalonnage C

Servizio svizzero di taratura

Accreditation No.: SCS 108

s Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization (p	o rotation around probe axis
Polarization 9	9 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:

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

Methods Applied and Interpretation of Parameters:

- NORMx, y, z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx, y, z: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx, y, z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

January 12, 2009

Probe ET3DV6

SN:1642

Manufactured: Last calibrated: Recalibrated: November 7, 2001 January 18, 2008 January 12, 2009

Calibrated for DASY Systems (Note: non-compatible with DASY2 system!)

January 12, 2009

DASY - Parameters of Probe: ET3DV6 SN:1642

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.68 ± 10.1%	$\mu V/(V/m)^2$	DCP X	91 mV
NormY	1.88 ± 10.1%	μV/(V/m) ²	DCP Y	93 mV
NormZ	1.66 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

Sensor Center to Phantom Surface Distance 3.	7 mm	
	r mm	4.7 mm
SAR _{be} [%] Without Correction Algorithm	10.1	5.8
SAR _{be} [%] With Correction Algorithm	0.9	0.5

Sensor Cente	r to Phantom Surface Distance	3.7 mm	4.7 mm
SAR _{6e} [%]	Without Correction Algorithm	12.6	8.1
SARbe [%]	With Correction Algorithm	0.9	0.6

Sensor Offset

Probe Tip to Sensor Center 2.7 mm

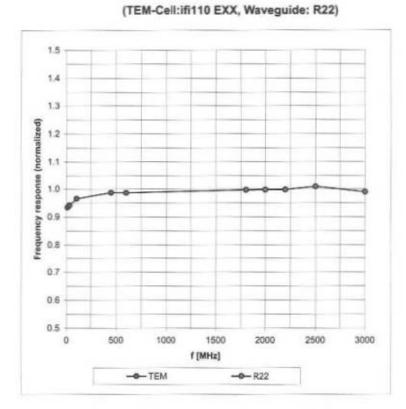
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

* The uncertainties of NormX,Y,Z do not affect the E¹-field uncertainty inside TSL (see Page 8).

⁸ Numerical linearization parameter; uncertainty not required,

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Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

January 12, 2009

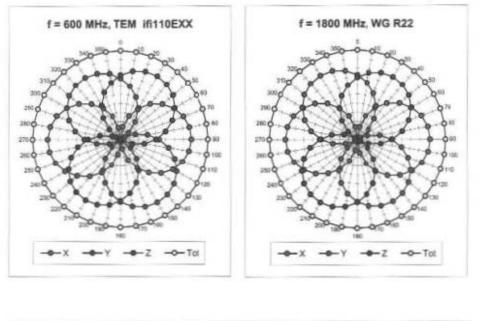


Frequency Response of E-Field

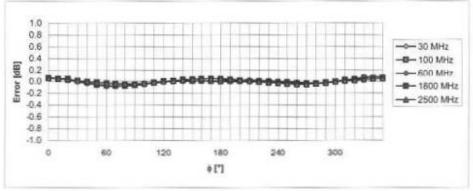
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

January 12, 2009



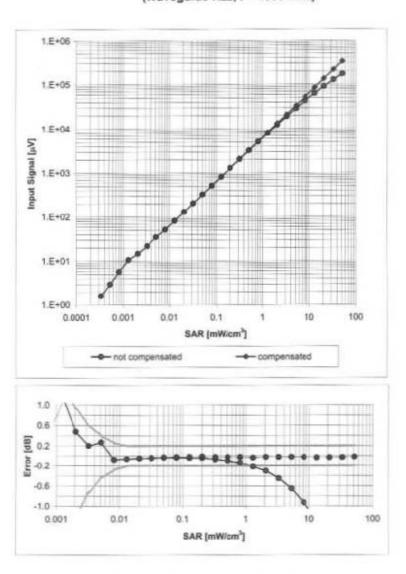
Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$



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

Testing Services™	Appendix D for the BlackBerry SAR Report	® Smartphone Model	RCS71CW	Page 8(29)
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS70C	CW

January 12, 2009

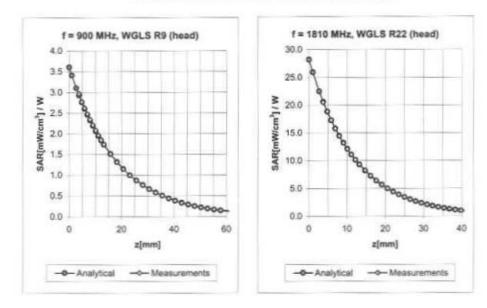


Dynamic Range f(SAR_{head}) (Waveguide R22, f = 1800 MHz)

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

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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%	0.40	2.33	6.06 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	$1.40 \pm 5\%$	0.54	2.62	5.14 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	$1.40 \pm 5\%$	0.67	2.35	4.88 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.90	1.74	4.54 ± 11.0% (k=2)
900	±50/±100	Body	$55.0 \pm 5\%$	1.05 ± 5%	0.37	2.77	5.99 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3±5%	1.52 ± 5%	0.85	2.33	4.71 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.60	2.30	4.61 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.90	1.89	4.02 ± 11.0% (k=2)

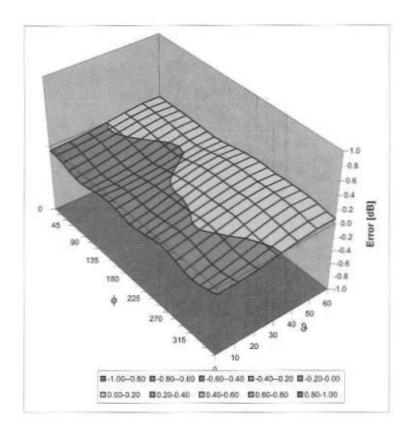
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Testing Services™	Appendix D for the BlackBerry® Smartphone Model RCS71CW SAR Report			Page 10(29)
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

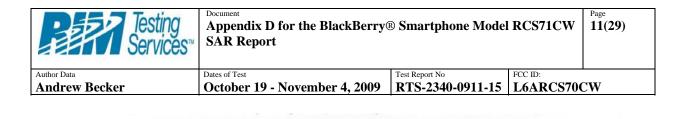
January 12, 2009

Deviation from Isotropy in HSL

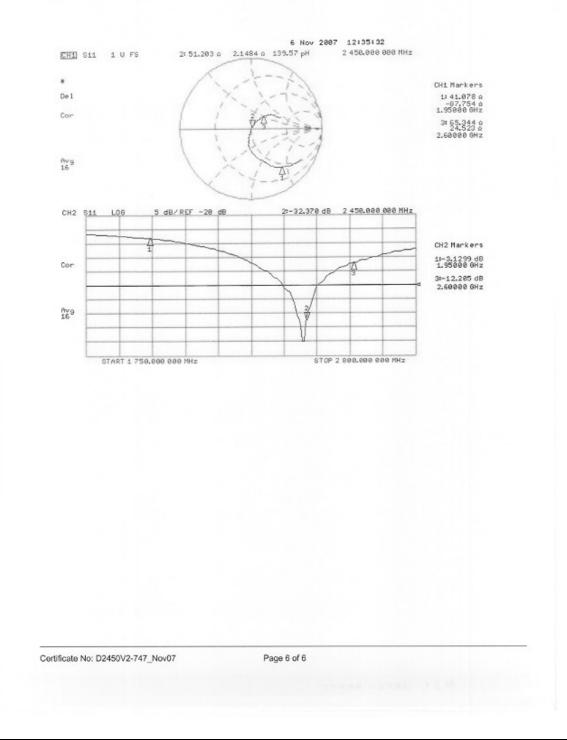
Error (\, 3), f = 900 MHz



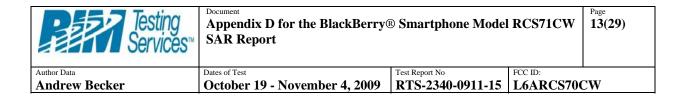
Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)



Impedance Measurement Plot for Head TSL



w Becker	Dates of Test October 19 - Nove	ember 4, 2009 Test Report No RTS-2340	-0911-15 FCC ID: L6ARCS70C	CW
W BEEKEI		1115-2340		
Calibration La Schmid & Partr Engineering / Zeughausstrasse 43,	ner		Service suisse d'étalonnage Servizio svizzero di taratura	
The Swiss Accreditat	riss Accreditation Service (SAS) tion Service is one of the signatori nt for the recognition of calibratio	ies to the EA	n No.: SCS 108	
	RIM Testing Services)	No. 1 (000 (1951 (1955	lo: D835V2-446_Jan09	
CALIBRAT	ION CERTIFICAT	E		
Object	D835V2 - SN: 4	46		
Calibration procedure		edure for dipole validation kits		
Calibration date:	January 05, 200	9		
Condition of the calibre	rated item In Tolerance			
This calibration certific The measurements and All calibrations have b	cate documents the traceability to na nd the uncertainties with confidence seen conducted in the closed laborat	tional standards, which realize the physical ur probability are given on the following pages a ory facility: environment temperature (22 ± 3)*	nd are part of the certificate.	
This calibration certifi The measurements at All calibrations have b Calibration Equipmen	cate documents the traceability to na nd the uncertainties with confidence seen conducted in the closed laborati t used (M&TE critical for calibration)	probability are given on the following pages a ory facility: environment temperature $(22 \pm 3)^{\circ}$	nd are part of the certificate. 'C and humidity < 70%.	
This calibration certific The measurements and All calibrations have b	cate documents the traceability to na nd the uncertainties with confidence seen conducted in the closed laboration t used (M&TE critical for calibration)	probability are given on the following pages a	nd are part of the certificate.	
This calibration certific The measurements at All calibrations have b Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 848	tate documents the traceability to na nd the uncertainties with confidence been conducted in the closed laboration t used (M&TE critical for calibration) ID # 2A GB37480704 11A US37292783	probability are given on the following pages a ory facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898)	nd are part of the certificate. IC and humidity < 70%. Scheduled Calibration Oct-09 Oct-09	
This calibration certifit The measurements and All calibrations have b Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 848 Reference 20 dB Atte	cate documents the traceability to na nd the uncertainties with confidence been conducted in the closed laboration t used (M&TE critical for calibration) ID # 2A GB37480704 11A US37292783 nuetor SN: 5086 (20g)	probability are given on the following pages a ory facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864)	nd are part of the certificate. IC and humidity < 70%. Scheduled Calibration Oct-09 Oct-09 Jul-09	
This calibration certifi The measurements at All calibrations have b Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 848 Reference 20 dB Atte Type-N mismatch con	cate documents the traceability to na nd the uncertainties with confidence teen conducted in the closed laboration t used (M&TE critical for calibration) ID # 2A GB37480704 11A US37292783 nuator SN: 5085 (20g) nbination SN: 5047.2 / 06327	probability are given on the following pages a ory facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867)	nd are part of the certificate. 'C and humidity < 70%. Scheduled Calibration Oct-09 Oct-09 Jul-09 Jul-09 Jul-09	
This calibration certifit The measurements and All calibrations have b Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 848 Reference 20 dB Atte	cate documents the traceability to na nd the uncertainties with confidence teen conducted in the closed laboration t used (M&TE critical for calibration) ID # 2A GB37480704 11A US37292783 nuator SN: 5085 (20g) nbination SN: 5047.2 / 06327	probability are given on the following pages a ory facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864)	nd are part of the certificate. IC and humidity < 70%. Scheduled Calibration Oct-09 Oct-09 Jul-09	
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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst Service suisse d'étalonnage

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

Accreditation No.: SCS 108

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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: D835V2-446_Jan09

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Testing Services™	Appendix D for the BlackBerry® Smartphone Model RCS71CW SAR Report			Page 14(29)
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009 RTS-2340-0911-15 L6ARCS700			CW

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
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	41.3 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C		

SAR result with Head TSL

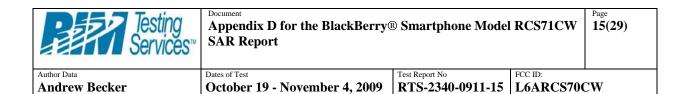
SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	9.50 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 mW / g
SAR normalized	normalized to 1W	6.32 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	6.27 mW /g ± 16.5 % (k=2)

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

Certificate No: D835V2-446_Jan09

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω - 6.9 jΩ	
Return Loss	- 23.3 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 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

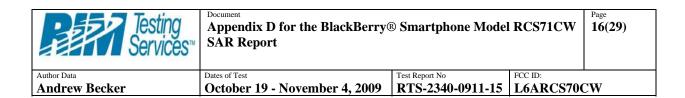
feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	October 24, 2001	

Certificate No: D835V2-446_Jan09

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DASY5 Validation Report for Head TSL

Date/Time: 05.01.2009 10:38:06

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:446

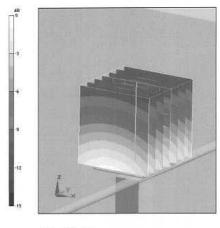
Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL 900 MHz Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.1; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = 0.024 dB Peak SAR (extrapolated) = 3.54 W/kg SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.58 mW/g Maximum value of SAR (measured) = 2.7 mW/g



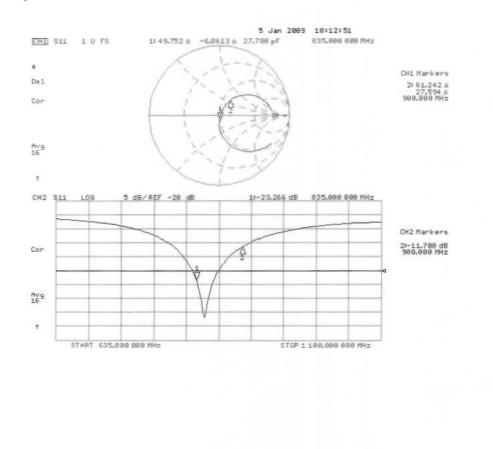
 $0 \, dB = 2.7 mW/g$

Certificate No: D835V2-446_Jan09

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Testing Services™	Appendix D for the BlackBerry® Smartphone Model RCS71CW SAR Report			Page 17(29)
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

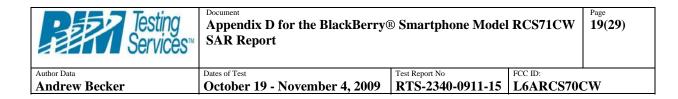
Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan09

Page 6 of 6

w Becker (ates of Test Dctober 19 - Novemb	er 4, 2009 Test Report No RTS-2340-0911	-15 L6ARCS70CW
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The Swiss Accreditation	Accreditation Service (SAS) Service is one of the signatorie or the recognition of calibration	is to the EA	No.: SCS 108
and a subscription of the	Testing Services)	A CONTRACTOR OF	o: D1900V2-545-Jan09
CALIBRATIC	N CERTIFICATI		
Object	D1900V2 - SN: 5	545	
Calibration procedure(s)	QA CAL-05.v7 Calibration proce	dure for dipole validation kits	
Calibration date:	January 06, 200	9	
Calibration date: Condition of the calibrate			
Condition of the calibrate This calibration certificate The measurements and t All calibrations have been	titem In Tolerance documents the traceability to national e uncertainties with confidence p	onal standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature (22 ± 3)*0	d are part of the certificate. C and humidity < 70%.
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Calibration Laboratory of Schmid & Partner Engineering AG Zeughavsstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst

Service suisse d'étalonnage

Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

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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
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- 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

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 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
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 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: D1900V2-545_Jan09

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Andrew Becker	October 19 - November 4, 2009	RTS-2340-0911-15	L6ARCS700	CW

Measurement Conditions

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

DASY Version	DASY5	V5.0
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	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.2 ± 6 %	1.47 mho/m ± 8 %
Head TSL temperature during test	(21.0 ± 0.2) °C	-	

SAR result with Head TSL

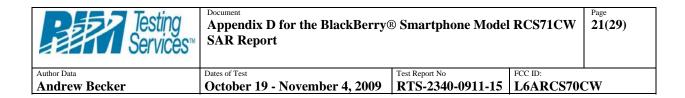
SAR averaged over 1 cm ² (1 g) of Head TSL	condition	
SAR measured	250 mW input power	10.2 mW / g
SAR normalized	normalized to 1W	40.8 mW/g
SAR for nominal Head TSL parameters 1	normalized to 1W	39.5 mW/g±17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.29 mW/g
SAR normalized	normalized to 1W	21.2 mW/g
SAR for nominal Head TSL parameters 1	normalized to 1W	20.8 mW / g ± 16.5 % (k=2)

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	49.9 Ω + 1.9 jΩ
Return Loss	- 34,4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 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	November 15, 2001

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DASY5 Validation Report for Head TSL

Date/Time: 06.01.2009 13:17:58

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

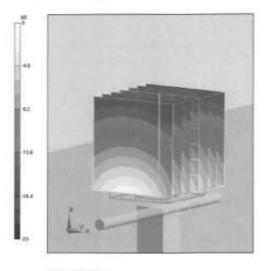
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB Medium parameters used: f = 1900 MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 28.04.2008.
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 92.5 V/m; Power Drift = 0.037 dB Peak SAR (extrapolated) = 19 W/kg SAR(1 g) - 10.2 mW/g; SAR(10 g) - 5.29 mW/g Maximum value of SAR (measured) = 12 mW/g



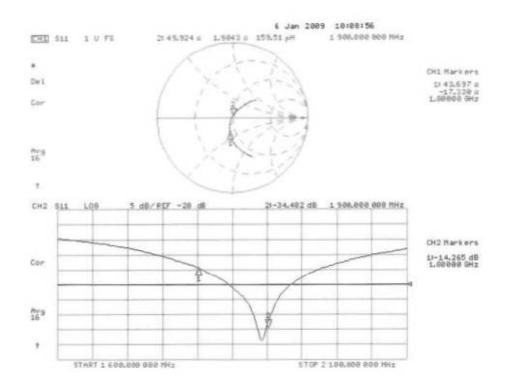
0 dB = 12 mW/g

Certificate No: D1900V2-545_Jan09

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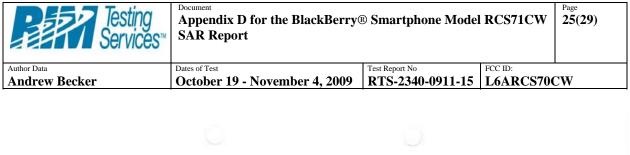
Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545_Jan09

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v Becker	Dates of Test October 19 - Nove	mber 4, 2009 Test Report No RTS-2340-	FCC ID: 0911-15 L6ARCS70	CW
Calibration Labor Schmid & Partner Engineering AG Zeughausstrasse 43, 8004		BAC MEA	Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service	
	creditation Service (SAS) Service is one of the signatorie r the recognition of calibration	s to the EA	No.: SCS 108	
Client RIM			: D2450V2-747_Nov07	
CALIBRATIO	N CERTIFICATE			
Object	D2450V2 - SN: 7	47		
Calibration procedure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits		
Calibration date:	November 06, 20	107		
Calibration date: Condition of the calibrated		107		
Condition of the calibrated This calibration certificate The measurements and th All calibrations have been Calibration Equipment use Primary Standards	Item In Tolerance documents the traceability to nati e uncertainties with confidence p conducted in the closed laborator d (M&TE critical for calibration)	onal standards, which realize the physical uni robability are given on the following pages and y facility: environment temperature (22 ± 3)*C Cal Date (Calibrated by, Certificate No.)	d are part of the cartificate. and humidity < 70%. Scheduled Calibration	
Condition of the calibrated This calibration certificate of The measurements and th All calibrations have been Calibration Equipment use Primary Standards Power meter EPM-442A Power sensor HP 8481A	Item In Tolerance	cnal standards, which realize the physical unit robability are given on the following pages and y facility: environment temperature (22 ± 3)*C Cal Date (Calibrated by, Certificate No.) 04-Oct-07 (METAS, No. 217-00736)	d are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-08 Oct-08	
Condition of the calibrated This calibration certificate The measurements and th All calibrations have been Calibration Equipment use Primary Standards Power meter EPM-442A	Item In Tolerance	onal standards, which realize the physical uni robability are given on the following pages and y facility: environment temperature (22 ± 3)*C Cal Date (Calibrated by, Certificate No.) 04-Oct-07 (METAS, No. 217-00736)	d are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-08	
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Condition of the calibrated This calibration certificate of The measurements and the All calibrations have been Calibration Equipment use Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 10 dB Attenuate Reference 10 dB Attenuate Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R8S SMT-06 Network Analyzer HP 8753	Item In Tolerance	cnal standards, which realize the physical unit robability are given on the following pages and ry facility: environment temperature (22 ± 3)*C Cal Date (Calibrated by, Certificate No.) 04-Oct-07 (METAS, No. 217-00736) 04-Oct-07 (METAS, No. 217-00736) 07-Aug-07 (METAS, No. 217-00718) 07-Aug-07 (METAS, No. 217-00718) 07-Aug-07 (METAS, No. 217-00718) 07-Aug-07 (METAS, No. 217-00718) 07-Aug-07 (SPEAG, No. DAE4-601_Jan07) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-07) 18-Oct-01 (SPEAG, in house check Oct-07) 18-Oct-01 (SPEAG, in house check Oct-07) Function	d are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-08 Oct-08 Aug-08 Aug-08 Oct-08 Jan-08 Scheduled Check In house check: Oct-08 In house check: Oct-09 In house check: Oct-08	



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



- Schweizerischer Kallbrierdienst Service suisse d'étalonnage
- Service suisse d'etalonnage Servizio svizzero di taratura
- Swiss Calibration Service

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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 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.

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Measurement Conditions

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

DASY Version	DASY4	V4.7
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	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.4±6%	1.85 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 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	13.6 mW / g
SAR normalized	normalized to 1W	54.4 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	53.2 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.27 mW/g
SAR normalized	normalized to 1W	25.1 mW/g
SAR for nominal Head TSL parameters 1	normalized to 1W	24.8 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	51.2 Ω + 2.1 jΩ	
Return Loss	– 32.4 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 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

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	December 01, 2003

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DASY4 Validation Report for Head TSL

Date/Time: 06.11.2007 15:01:41

Test Laboratory: SPEAG, Zurich, Switzerland

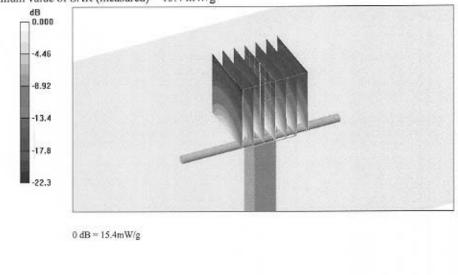
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN747

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB; Medium parameters used: f = 2450 MHz; σ = 1.79 mho/m; ϵ_r = 38; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 SN3025 (HF); ConvF(4.41, 4.41, 4.41); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 93.4 V/m; Power Drift = 0.016 dB Peak SAR (extrapolated) = 29.4 W/kg SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.27 mW/g Maximum value of SAR (measured) = 15.4 mW/g

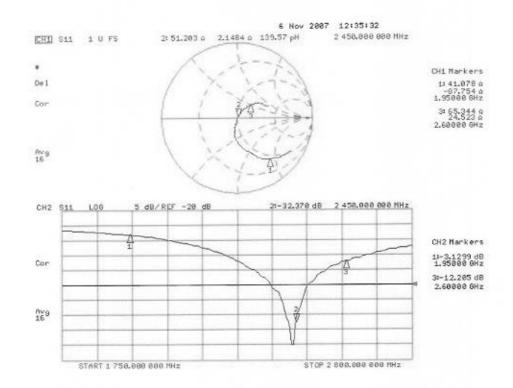


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Impedance Measurement Plot for Head TSL



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