Testing Services	Document Appendix D for the BlackBerry® Smartphone Model REA71UW/REB71UW SAR Report				
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW L6AREB70UW		

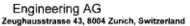
APPENDIX D: PROBE & DIPOLE CALIBRATION DATA



Author Data **Andrew Becker**

Dates of Test	Test Report No	FCC ID:	IC ID
August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
		L6AREB70UW	2503A-REB70UW

Calibration Laboratory of Schmid & Partner





Schweizerischer Kalibrierdienst Service suisse d'étalonnage С Servizio svizzero di taratura s Swiss Calibration Service

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Client RTS (RIM Testing Services)

Certificate No: ES3-3225_Jan11

Accreditation No.: SCS 108

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Dbject	ES3DV3 - SN:3	225	
Calibration procedure(s)		QA CAL-23.v4 and QA CAL-25.v3 edure for dosimetric E-field probe	
			방송(영영) 것이라는 이가 가지?
Calibration date:	January 13, 201	Hara Attach samalara	
The measurements and the unc	ertainties with confidence	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature $(22 \pm 3)^{\circ}$ C	d are part of the certificate.
Calibration Equipment used (M8			and nonneight 1030.
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator	SN: S5054 (3c) SN: S5086 (20b)	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161)	Mar-11 Mar-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b)	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160)	Mar-11 Mar-11 Mar-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2	SN: S5054 (3c) SN: S5086 (20b)	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161)	Mar-11 Mar-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10)	Mar-11 Mar-11 Mar-11 Dec-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 660	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10) 20-Apr-10 (No. DAE4-660_Apr10)	Mar-11 Mar-11 Mar-11 Dec-11 Apr-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 660	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10) 20-Apr-10 (No. DAE4-660_Apr10) Check Date (in house)	Mar-11 Mar-11 Mar-11 Dec-11 Apr-11 Scheduled Check
Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 660 ID # US3642U01760	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10) 20-Apr-10 (No. DAE4-660_Apr10) Check Date (in house) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-10) Function	Mar-11 Mar-11 Dec-11 Apr-11 Scheduled Check In house check: Oct-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 660 ID # US3642U01700 US37390585	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10) 20-Apr-10 (No. DAE4-660_Apr10) Check Date (in house) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-10)	Mar-11 Mar-11 Dec-11 Apr-11 Scheduled Check In house check: Oct-11 In house check: Oct-11
Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 660 ID # US3642U01700 US37390585 Name	30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 29-Dec-10 (No. ES3-3013_Dec10) 20-Apr-10 (No. DAE4-660_Apr10) Check Date (in house) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-10) Function	Mar-11 Mar-11 Dec-11 Apr-11 Scheduled Check In house check: Oct-11 In house check: Oct-11

Certificate No: ES3-3225_ Jan11

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Author Data Andrew Becker

Dates of Test	Test Report No	FCC ID:	IC ID
August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
		L6AREB70UW	2503A-REB70UW

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



- S Schweizerischer Kalibrierdienst Service suisse d'étalonnage
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Accreditation No.: SCS 108

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Glossary:

Q.00000.j.	
TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization o	φ 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., 9 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

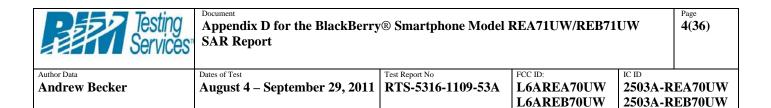
- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held 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 ℜ = 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 with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z; A, B, C are numerical linearization parameters assessed based on the data of
 power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the
 maximum calibration range expressed in RMS voltage across the diode.
- 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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ES3DV3 SN:3225

January 13, 2011

Probe ES3DV3

SN:3225

Manufactured: Last calibrated: Recalibrated: September 1, 2009 December 11, 2009 January 13, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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			L6AREB70UW	2503A-REB70UW

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DASY/EASY - Parameters of Probe: ES3DV3 SN:3225

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	1.26	1.21	1.31	± 10.1%
DCP (mV) ⁸	102.1	100.8	99.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	С	VR mV	Unc ^t (k=2)
10000	CW	0.00	х	0.00	0.00	1.00	149.8	± 2.6 %
			Y	0.00	0.00	1.00	148.1	
			Z	0.00	0.00	1.00	110.7	

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 \vec{E}^2 -field uncertainty inside TSL (see Pages 5 and 6).

⁸ Numerical linearization parameter: uncertainty not required.

^c Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

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Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

ES3DV3 SN:3225

January 13, 2011

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DASY/EASY - Parameters of Probe: ES3DV3 SN:3225

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvFX Co	nvFY Cor	wF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.47	6.47	6.47	0.89	1.08 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.11	6.11	6.11	0.81	1.10 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.26	5.26	5.26	0.37	1.68 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.98	4.98	4.98	0.48	1.51 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.60	4.60	4.60	0.52	1.54 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.52	4.52	4.52	0.53	1.58 ± 11.0%

^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: ES3-3225_Jan11

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011			2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

ES3DV3 SN:3225

January 13, 2011

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DASY/EASY - Parameters of Probe: ES3DV3 SN:3225

Calibration Parameter Determined in Body Tissue Simulating Media

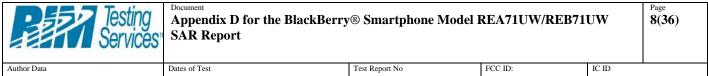
f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X Co	nvFY Co	nvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	$55.5 \pm 5\%$	0.96 ± 5%	6.30	6.30	6.30	0.76	1.17 ± 11.0%
900	± 50 / ± 100	$55.0 \pm 5\%$	1.05 ± 5%	6.12	6.12	6.12	0.72	1.20 ±11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.88	4.88	4.88	0.26	2.70 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.89	4.89	4.89	0.33	2.28 ±11.0%
2450	± 50 / ± 100	52.7 ± 5%	$1.95 \pm 5\%$	4.43	4.43	4.43	0.99	1.04 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.29	4.29	4.29	0.99	1.05 ± 11.0%

[©] 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.

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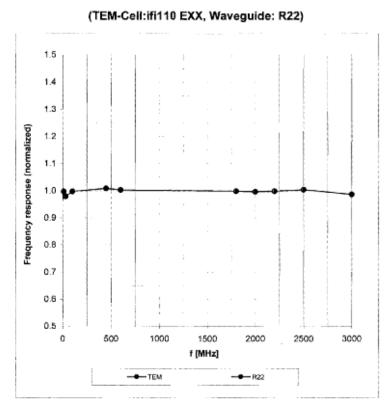


Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

ES3DV3 SN:3225

January 13, 2011

Frequency Response of E-Field

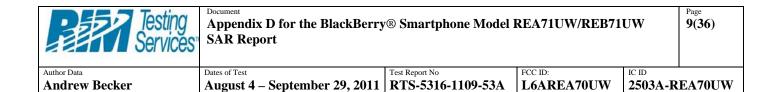


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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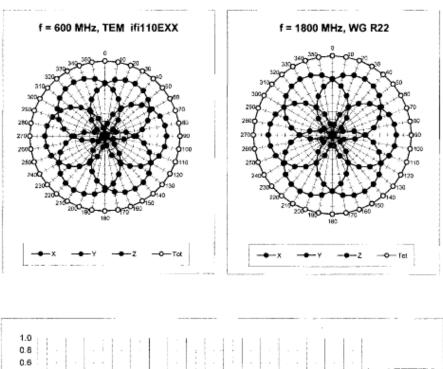


ES3DV3 SN:3225

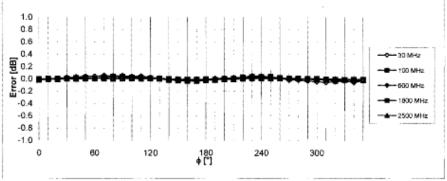
January 13, 2011

2503A-REB70UW

L6AREB70UW



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



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

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Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

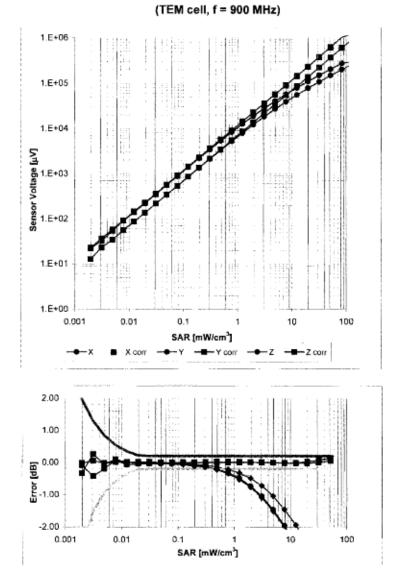
ES3DV3 SN:3225

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Dynamic Range f(SAR_{head})

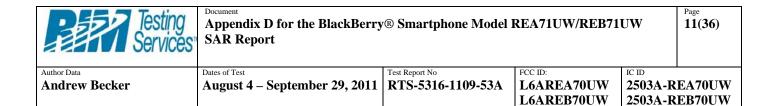


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ES3-3225_Jan11

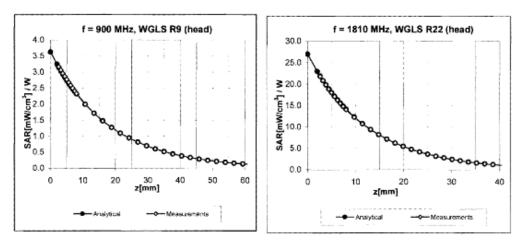
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ES3DV3 SN:3225

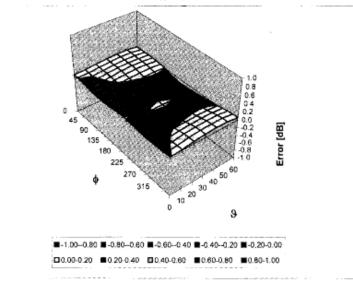
January 13, 2011



Conversion Factor Assessment

Deviation from Isotropy in HSL

Error (4, 3), f = 900 MHz



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

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
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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	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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 Document
 Appendix D for the BlackBerry® Smartphone Model REA71UW/REB71UW

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 SAR Report

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UW/KED/IUW	13(30)

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Author Data		Dates of Test	G 4 1 00 001	Test Report No	FCC ID:	
Andrew Becke	r	August 4 -	- September 29, 201	1 RTS-5316-1109-53A	L6AREA70UW L6AREB70UW	2503A-REA70UV 2503A-REB70UV
	Calibration L Schmid & Par Engineering _{Zeughausstrasse} 4	tner AG	lac	SINISS S C C C C C C C C C C C C C S C C S C C S S C S	Schweizerischer Kallbrierdie Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service	enst
		tation Service is	n Service (SAS) one of the signatories to the gnition of calibration certific	EA	No.: SCS 108	
	Client RTS (RIM Testing	Services)	Certificate No:	D835V2-446_Jan11	
	CALIBRA	TION CE	RTIFICATE			
	Object	ſ	D835V2 - SN: 446	garan sa sa sa sa		
	Calibration procedu		QA CAL-05.v8 Calibration procedure f	or dipole validation kits		
	Calibration date:		January 21, 2011			
	The measurements	and the uncertai	nties with confidence probabilit	ndards, which realize the physical unit y are given on the following pages and	are part of the certificate.	
			critical for calibration)	/: environment temperature (22 ± 3)°C	and humiday < 70%.	
	Primary Standards Power meter EPM-			ate (Certificate No.)	Scheduled Calibration Oct-11	
	Power sensor HP 8			ct-10 (No. 217-01266)	Oct-11	
	Reference 20 dB A			ar-10 (No. 217-01158)	Mar-11	
	Type-N mismatch of			ar-10 (No. 217-01162)	Mar-11	
	Reference Probe E			pr-10 (No. ES3-3205_Apr10)	Apr-11	
	DAE4			in-10 (No. DAE4-601_Jun10)	Jun-11	
	Secondary Standar	ds	ID # Chec	k Date (in house)	Scheduled Check	
	Power sensor HP 8			ct-02 (in house check Oct-09)	In house check: Oct-11	
	RF generator R&S			g-99 (in house check Oct-09)	In house check: Oct-11	
	Network Analyzer H			ct-01 (in house check Oct-10)	In house check: Oct-11	

Calibrated by:	Name Dimce liley	Function Laboratory Technician	Signature D. Vill
Approved by:	Katja Pokovic	Technical Manager	LA
This calibration certificate sh	all not be reproduced except in full without	t written approval of the laboratory.	Issued: January 21, 2011

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Author Data Andrew Becker

Dates of Test	Test Report No	FCC ID:	IC ID
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		L6AREB70UW	2503A-REB70UW

Calibration Laboratory of

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





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 - Swiss Calibration Service

Accreditation No.: SCS 108

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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_Jan11

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Measurement Conditions

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

DASY Version	DASY5	V52.6
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 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(21.8 ± 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	2.39 mW / g
SAR normalized	normalized to 1W	9.56 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.63 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.27 mW /g ± 16.5 % (k=2)

Certificate No: D835V2-446_Jan11



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.6 Ω - 7.7 jΩ
Return Loss	- 22.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction) 1.386 ns	Delay (one direction) 1.	.386 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_Jan11



DASY5 Validation Report for Head TSL

Date/Time: 21.01.2011 10:18:05

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Test Laboratory: SPEAG, Zurich, Switzerland

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

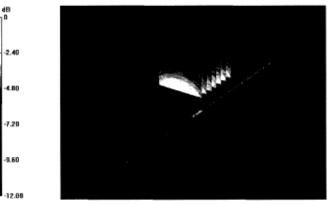
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL900 Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ϵ_r = 41.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.426 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 3.600 W/kg SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.56 mW/g Maximum value of SAR (measured) = 2.790 mW/g



 $0 \, dB = 2.790 \, mW/g$

Certificate No: D835V2-446_Jan11

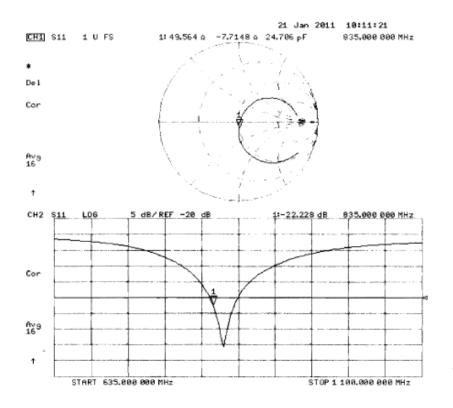
Page 5 of 6

Testing Services	Document Appendix D for the BlackBerry SAR Report	® Smartphone Model 1	REA71UW/REB71	UW ^{Page} 18(36)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW

L6AREB70UW

2503A-REB70UW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan11

Page 6 of 6

w Becker	Dates of Test August 4 – September	29, 2011 RTS-5316-1109-53	A L6AREA70UW	іс ір 2503А-REA7(2503А-REB7(
Calibration Labo Schmid & Partner Engineering AG Zeughausstrasse 43, 800	r	Hac-MRA CRANKS S	Service suisse d'étalonnage Servizio svizzero di taratura	nst
The Swiss Accreditation Multilateral Agreement	Accreditation Service (SAS) n Service is one of the signatori for the recognition of calibration	es to the EA n certificates	n No.: SCS 108	
	Testing Services)		lo: D1800V2-2d020_Jan	11 - 37 - 72
Object		2d020		
Calibration procedure(s)	Calibration proc	edure for dipole validation kits		
	اللەردى ئەرىپ ئەرىپ ئەرىپىيى دى. مەرىپ			
Calibration date:	January 13, 201	1 - Arto Marsard State and		
This calibration certificat The measurements and All calibrations have bee	e documents the traceability to na the uncertainties with confidence	tional standards, which realize the physical up probability are given on the following pages a ory facility: environment temperature (22 ± 3)	nits of measurements (SI). nd are part of the certificate.	
This calibration certificat The measurements and All calibrations have bee Calibration Equipment us	e documents the traceability to na the uncertainties with confidence in conducted in the closed laboration sed (M&TE critical for calibration)	tional standards, which realize the physical u probability are given on the following pages a ory facility: environment temperature (22 ± 3)	nits of measurements (SI). nd are part of the certificate. °C and humidity < 70%.	
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This calibration certificat The measurements and All calibrations have bee Calibration Equipment us Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenus Type-N mismatch combi Reference Probe ES3DV DAE4 Secondary Standards Power sensor HP 8481A	e documents the traceability to na the uncertainties with confidence in conducted in the closed laborate sed (M&TE critical for calibration) ID # GB37480704 US37292783 ator SN: 5086 (200) ination SN: 5047.2 / 06327 /3 SN: 3205 SN: 601 ID # MY41092317 -06 100005	tional standards, which realize the physical up probability are given on the following pages a ory facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01162) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09)	nits of measurements (SI). nd are part of the certificate. °C and humidity < 70%. <u>Scheduled Calibration</u> Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 <u>Scheduled Check</u> In house check: Oct-11	
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Author Data Andrew Becker Dates of Test FCC ID: Test Report No IC ID August 4 – September 29, 2011 RTS-5316-1109-53A L6AREA70UW 2503A-REA70UW L6AREB70UW 2503A-REB70UW

Calibration Laboratory of

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



s Service suisse d'étalonnage С

Schweizerischer Kalibrierdienst

- Servizio svizzero di taratura
- 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

Glossarv:

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. ٠ 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: D1800V2-2d020 Jan11

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Accreditation No.: SCS 108



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm with Space	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 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	38.6 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 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	9.78 mW / g
SAR normalized	normalized to 1W	39.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	39.2 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.13 mW / g
SAR normalized	normalized to 1W	20.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.5 mW /g ± 16.5 % (k=2)



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW L6AREB70UW	2503A-REA70UW 2503A-REB70UW
			201112210011	

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point		46.5 Ω - 7.3 jΩ		
B	Return Loss	- 21.5 dB		

General Antenna Parameters and Design

Electrical Delay (one direction)	1.216 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 07, 2001



DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 12:34:12

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Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:2d020

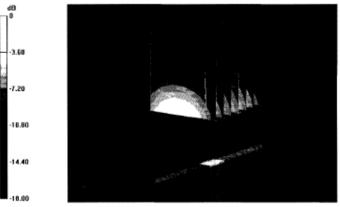
Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ϵ_r = 38.7; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.05, 5.05, 5.05); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

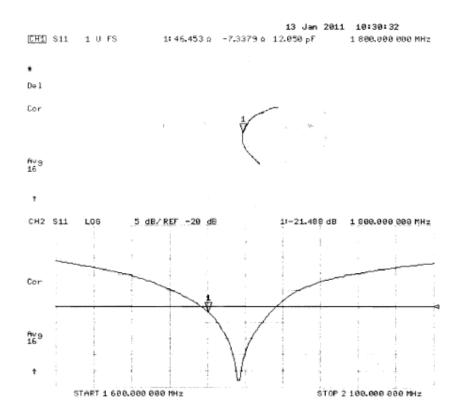
grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.654 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 17.902 W/kg SAR(I g) = 9.78 mW/g; SAR(10 g) = 5.13 mW/g Maximum value of SAR (measured) = 12.051 mW/g



 $0 \, dB = 12.050 \, mW/g$

Testing Services	Document Appendix D for the BlackBerry SAR Report	Appendix D for the BlackBerry® Smartphone Model REA71UW/REB71UW SAR Report			Page 24(36)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW L6AREB70UW		EA70UW EB70UW

Impedance Measurement Plot for Head TSL



Testing Services

Client

Document Appendix D for the BlackBerry® Smartphone Model REA71UW/REB71UW SAR Report

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Author Data	
Andrew	Becker

Dates of Test	Test Report No	FCC ID:	IC ID
August 4 – September 29, 2011	RTS-5316-1109-53A		2503A-REA70UW
		L6AREB70UW	2503A-REB70UW

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



S Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura S swiss Calibration Service

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RTS (RIM Testing Services)

Certificate No: D1900V2-545_Jan11

Accreditation No.: SCS 108

CALIBRATION C	ERTIFICATE		A 1997
Object	D1900V2 - SN: 5	45 - 1999 - 1990 - 1999 - 19	FRANCE - STATE
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
	t in the state of	en al antigation de la companya de A companya de la comp	and the fight the second stand
Calibration date:	January 13, 2011	a ka sa sana da ana ana 201 na ana ang sa	
The measurements and the unce	rtainties with confidence p	onal standards, which realize the physical un robability are given on the following pages ar y facility: environment temperature $(22 \pm 3)^{64}$	d are part of the certificate.
Calibration Equipment used (M&	E critical for calibration)		
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
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	100005	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
	Name	Function	Signature
Calibrated by:	Dimce Rev	Laboratory Technician	D'Riev
Approved by:	Katja Pokovic	Technical Menager	De hay
This collection confidents shall be	at he second used support (m	A.H. When the state of the laboratory	issued: January 14, 2011
rms calibration certificate shall h	or os reproduced except in	full without written approval of the laboratory	



Author Data Andrew Becker

Dates of Test	Test Report No	FCC ID:	IC ID	
August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW	
		L6AREB70UW	2503A-REB70UW	

Calibration Laboratory of

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



- Schweizerischer Kalibrierdienst s Service suisse d'étalonnage
- С Servizio svizzero di taratura
- 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
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: D1900V2-545 Jan11

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Accreditation No.: SCS 108



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Measurement Conditions

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

DASY Version	DASY5	V52.6
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	38.5 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C		

SAR result with Head TSL

Condition	
250 mW input power	10.2 mW / g
normalized to 1W	40.8 mW / g
normalized to 1W	40.0 mW /g ± 17.0 % (k=2)
	, , , , , , , , , , , , , , , , , , ,
condition	
	5.26 mW / g
condition	
	250 mW input power

Certificate No: D1900V2-545_Jan11



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω + 1.8 jΩ
Return Loss	- 34.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 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

Certificate No: D1900V2-545_Jan11

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 14:52:49

Test Laboratory: SPEAG, Zurich, Switzerland

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

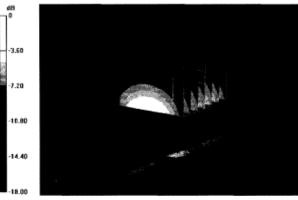
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε _r = 38.6; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

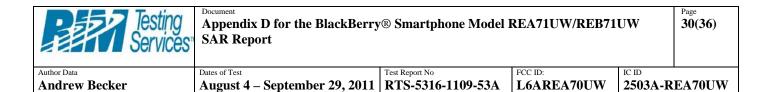
grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 98.053 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 18.648 W/kg SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.26 mW/g Maximum value of SAR (measured) = 12.743 mW/g





Certificate No: D1900V2-545_Jan11

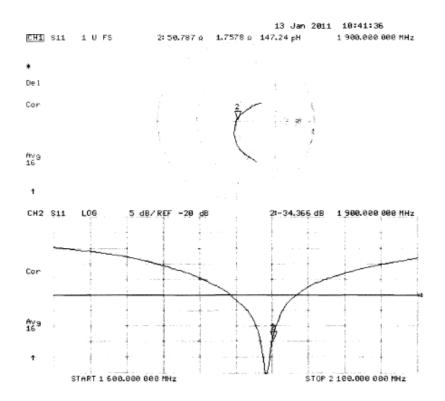
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L6AREB70UW

2503A-REB70UW

Impedance Measurement Plot for Head TSL



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Services"	Appendix D for the Bl SAR Report	ackBerry® Smartphone Model 1	REA71UW/REB71	UW ^{Page} 31(3
v Becker	Dates of Test August 4 – September 2	29, 2011 RTS-5316-1109-53A	FCC ID: L6AREA70UW L6AREB70UW	IC ID 2503A-REA70 2503A-REB70
Calibration Lab Schmid & Partne Engineering A(Zeughausstrasse 43, 80	er	BC MRA C SRATC	Schweizerischer Kalibrier Service suisse d'étalonna Servizio svizzero di taratu Swiss Calibration Service	ge
The Swiss Accreditatio	Accreditation Service (SAS) on Service is one of the signatoric t for the recognition of calibration	es to the EA	40.: SCS 108	
Client RTS (RII	M Testing Services)	Certificate No:	D2450V2-747_Nov	99
CALIBRATI	ON CERTIFICATI			
Object	D2450V2 - SN: 1	147,	a Stand Class	že stati s
Calibration procedure(s	NAME OF TAXABLE AND A DATABASE	edure for dipole validation kits		
Calibration date:	November 11, 2	009 11 11 14 2 2 4 4 4 4 5 113		
The measurements and All calibrations have be	d the uncertainties with confidence p	tional standards, which realize the physical units probability are given on the following pages and ory facility: environment temperature (22 ± 3)°C	are part of the certificate.	
		Out Date (Out Frank No.)		
Primary Standards Power meter EPM-442/	ID # A GB37480704	Cal Date (Certificate No.)	Scheduled Calibration Oct-10	
Power sensor HP 8481		06-Oct-09 (No. 217-01086) 06-Oct-09 (No. 217-01086)	Oct-10 Oct-10	
Reference 20 dB Atten		31-Mar-09 (No. 217-01000)	Mar-10	
Type-N mismatch comb	1 01			
		31-Mar-09 (No. 217-01029)	Mar-10	
Reference Probe ES3D	DV3 SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10	
Reference Probe ES3D DAE4	SN: 3205 SN: 601			
		26-Jun-09 (No. ES3-3205_Jun09)	Jun-10	
DAE4 Secondary Standards Power sensor HP 8481	SN: 601 ID # IA MY41092317	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09)	Jun-10 Mar-10	1
DAE4 Secondary Standards Power sensor HP 8481 RF generator R&S SMT	SN: 601 ID # IA MY41092317 T-06 100005	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house)	Jun-10 Mar-10 Scheduled Check	1
DAE4 Secondary Standards Power sensor HP 8481	SN: 601 ID # IA MY41092317 T-06 100005	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house) 18-Oct-02 (in house check Oct-09)	Jun-10 Mar-10 Scheduled Check In house check: Oct-1	.
DAE4 Secondary Standards Power sensor HP 8481. RF generator R&S SMT Network Analyzer HP 8	SN: 601 ID # IA MY41092317 T-06 100005 3753E US37390585 S4206 Name	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09) Function	Jun-10 Mar-10 Scheduled Check In house check: Oct-1 In house check: Oct-1	
DAE4 Secondary Standards Power sensor HP 8481 RF generator R&S SMT	SN: 601 ID # IA MY41092317 T-06 100005 8753E US37390585 S4206	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09)	Jun-10 Mar-10 Scheduled Check In house check: Oct-1 In house check: Oct-1 In house check: Oct-1	.
DAE4 Secondary Standards Power sensor HP 8481. RF generator R&S SMT Network Analyzer HP 8	SN: 601 ID # IA MY41092317 T-06 100005 3753E US37390585 S4206 Name	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09) Function	Jun-10 Mar-10 Scheduled Check In house check: Oct-1 In house check: Oct-1 In house check: Oct-1	
DAE4 Secondary Standards Power sensor HP 8481. RF generator R&S SMT Network Analyzer HP 8 Calibrated by: Approved by:	SN: 601 ID # IA MY41092317 T-06 100005 8753E US37390585 S4206 Name Mike Metil Ketja Pokovic	26-Jun-09 (No. ES3-3205_Jun09) 07-Mar-09 (No. DAE4-601_Mar09) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09) Function Laboratory Technicies	Jun-10 Mar-10 Scheduled Check In house check: Oct-1 In house check: Oct-1 In house check: Oct-1	E C



Author Data Andrew Becker Dates of Test Test Report No FCC ID: IC ID RTS-5316-1109-53A L6AREA70UW August 4 – September 29, 2011 2503A-REA70UW L6AREB70UW 2503A-REB70UW

Calibration Laboratory of

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





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Schweizerischer Kalibrierdienst Service suisse d'étalonnage

С Servizio svizzero di taratura

s 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. ٠ 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: D2450V2-747 Nov09

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Measurement Conditions

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

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	10 mm with Space	
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	39.1 ± 6 %	1.78 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 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	13.3 mW / g
SAR normalized	normalized to 1W	53.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.4 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.23 mW / g
SAR normalized	normalized to 1W	24.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.9 mW /g ± 16.5 % (k=2)

Certificate No: D2450V2-747_Nov09



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.9 Ω + 0.9 jΩ
Return Loss	- 33.9 dB

General Antenna Parameters and Design

	Electrical Delay (one direction)	1.161 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	December 01, 2003

Certificate No: D2450V2-747_Nov09



DASY5 Validation Report for Head TSL

Date/Time: 11.11.2009 15:04:10

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Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:747

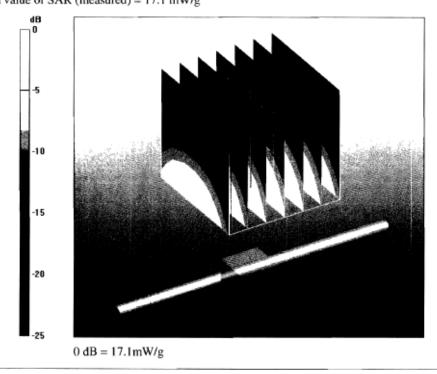
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: HSL U11 BB Medium parameters used: f = 2450 MHz; σ = 1.79 mho/m; ϵ_r = 39.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

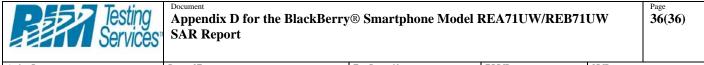
- Probe: ES3DV3 SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 101.3 V/m; Power Drift = 0.067 dB Peak SAR (extrapolated) = 27 W/kg SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.23 mW/g Maximum value of SAR (measured) = 17.1 mW/g

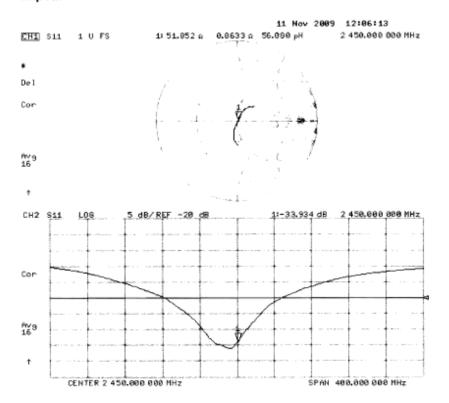


Certificate No: D2450V2-747_Nov09



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	August 4 – September 29, 2011	RTS-5316-1109-53A	L6AREA70UW	2503A-REA70UW
			L6AREB70UW	2503A-REB70UW

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-747_Nov09

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