Testin Service	Page 1(114)			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

Services Rep	pendix D for the Bi port	lackBerry® Smartphone Mode	el RFA91LW SAR	2(114)
8	est 1 – Nov 23, 2012 7-11, 2013	Test Report No RTS-6012-1211-32 Rev 3	FCC ID: L6ARFA90LW	IC ID 2503A-RFA90L
Calibration Laborato Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zur	-	BAC MRA (PANIS) S C C C C C C C C C C C C S	Schweizerischer Kalibrierdi Service suisse d'étalonnag Servizio svizzero di taratura Swiss Calibration Service	e
Accredited by the Swiss Accredi The Swiss Accreditation Servi Multilateral Agreement for the	ice is one of the signatories	s to the EA	No.: SCS 108	
Client RTS (RIM Tes	ting Services)	Certificate No:	ES3-3225_Jan12	
CALIBRATION	CERTIFICATI		1 4 4 4	2 6
Object	ES3DV3 - SN:32	25		
Calibration procedure(s)		DA CAL-23.v4, QA CAL-25.v4 idure for dosimetric E-field probes		
Collinguities dates				
Calibration date: This calibration certificate docur	Uanuary 11, 2012	2 onal standards, which realize the physical units	of measurements (SI).	
This calibration certificate docur The measurements and the unc	ments the traceability to nation of the traceability to nation of the confidence provident of the closed laborator of the clos	and here and	are part of the certificate.	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi	ments the traceability to natio certainties with confidence pr ucted in the closed laborator &TE critical for calibration)	onal standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C (are part of the certificate. and humidity < 70%.	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards	ments the traceability to natio certainties with confidence pr ucted in the closed laborator &TE critical for calibration)	onal standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C (Cal Date (Certificate No.)	are part of the certificate. and humidity < 70%.	
This calibration certificate document The measurements and the uncompared of the measurements and the uncompared of the conduct of the measurement of the conduct of the co	ments the traceability to natio certainties with confidence pr ucted in the closed laborator &TE critical for calibration)	onal standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C a Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards	ments the traceability to natio certainties with confidence pr ucted in the closed laborator &TE critical for calibration)	onal standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C (Cal Date (Certificate No.)	are part of the certificate. and humidity < 70%.	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A	ments the traceability to natio certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087	onal standarda, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C / Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator	ments the traceability to natio certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c)	onal standarda, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C / Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator	ments the traceability to natio certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b)	onal standarda, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C / Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12	
This calibration certificate docu The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator	ments the traceability to native certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b)	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Apr-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E44198 Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 3 dB Attenuator Reference Probe ES3DV2 DAE4	ments the traceability to native certainties with confidence provide the confidence provided in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: 3013 SN: 654	onai standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C i Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Ma Primary Standards Power meter E4419B Power sensor E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 20 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards	ments the traceability to native certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 654 ID	onai standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C i 2 Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E44198 Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C	ments the traceability to native certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: 55054 (3c) SN: 55054 (3c) SN: 55056 (20b) SN: 55129 (30b) SN: 3013 SN: 654 ID US3642U01700	onai standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C i 2 Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Dec-12 May-12 Scheduled Check In house check: Apr-13	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Ma Primary Standards Power meter E4419B Power sensor E4419A Reference 3 dB Attenuator Reference 3 dB Attenuator Reference 20 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards	ments the traceability to native certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 654 ID	onai standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C i 2 Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E44198 Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C	ments the traceability to native certainties with confidence pro- ucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: 55054 (3c) SN: 55054 (3c) SN: 55056 (20b) SN: 55129 (30b) SN: 3013 SN: 654 ID US3642U01700	onai standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C i 2 Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11)	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Dec-12 May-12 Scheduled Check In house check: Apr-13	
This calibration certificate docu The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 20 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference 9 ob ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	ments the traceability to native certainties with confidence provided in the closed laborator at the c	onal standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C = Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Oct-01 (in house check Act-11) Function	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13 In house check: Oct-12	
This calibration certificate docur The measurements and the uno All calibrations have been cond Calibration Equipment used (Mi Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 3 dB Attenuator Reference 20 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E Calibrated by:	ments the traceability to native certainties with confidence pro- lucted in the closed laborator &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 654 ID US3642U01700 US3642U01700 US37390585 Name Jeton Kastrell	onal standards, which realize the physical units robability are given on the following pages and y facility: environment temperature (22 ± 3)°C i Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01367) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Oct-01 (in house check Apr-11) 18-Oct-01 (in house check Apr-11) Function	are part of the certificate. and humidity < 70%. Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13 In house check: Oct-12	2

Certificate No: ES3-3225_Jan12

Page 1 of 11



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

Author Data Dates of Test Aug 21

Aug 21 – Nov 23, 2012 Jan. 07-11, 2013 Test Report No RTS-6012-1211-32 Rev 3 FCC ID: L6ARFA90LW

s

IC ID 2503A-RFA90LW

Calibration Laboratory of

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



S Schweizerischer Kalibrierdienst C Service suisse d'étalonnage

Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

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

Glossary:

o	
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 ϕ	φ rotation around probe axis
Polarization 8	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 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 affect 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.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- 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.

Certificate No: ES3-3225_Jan12

Page 2 of 11

Testing Service	Appendix D for the Bla Report	Page 4(114)		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 11, 2012

Probe ES3DV3

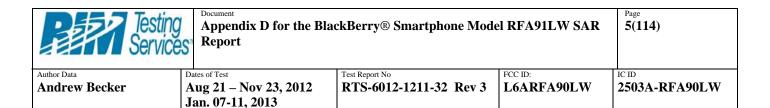
SN:3225

Manufactured: Calibrated: September 1, 2009 January 11, 2012

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

Certificate No: ES3-3225_Jan12

Page 3 of 11



January 11, 2012

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	1.20	1.30	± 10.1 %
DCP (mV) ⁸	101.2	100.8	101.2	

Modulation Calibration Parameters

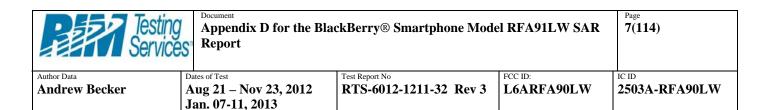
UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^t (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	107.7	±1.7 %
			Y	0.00	0.00	1.00	113.4	
			Z	0.00	0.00	1.00	110.4	

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 E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required. ^c Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW	



January 11, 2012

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

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.42	6.42	6.42	0.27	2.04	± 12.0 %
900	41.5	0.97	6.06	6.06	6.06	0.35	1.74	± 12.0 %
1810	40.0	1.40	5.23	5.23	5.23	0.73	1.21	± 12.0 %
1950	40.0	1.40	4.98	4.98	4.98	0.58	1.41	± 12.0 %
2450	39.2	1.80	4.50	4.50	4.50	0.79	1.26	± 12.0 %
2600	39.0	1.96	4.32	4.32	4.32	0.77	1.32	± 12.0 %

Calibration Parameter Determined in Head Tissue Simulating Media

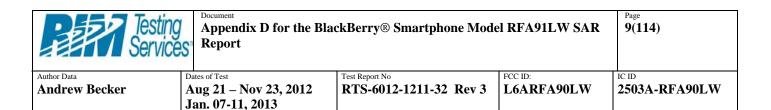
^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ⁷ At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to

⁷ At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: ES3-3225_Jan12

Page 5 of 11

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW	



January 11, 2012

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

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.27	6.27	6.27	0.36	1.74	± 12.0 %
900	55.0	1.05	6.07	6.07	6.07	0.29	2.02	± 12.0 %
1810	53.3	1.52	4.92	4.92	4.92	0.50	1.57	± 12.0 %
1950	53.3	1.52	4.87	4.87	4.87	0.59	1.49	± 12.0 %
2450	52.7	1.95	4.30	4.30	4.30	0.68	1.16	± 12.0 %
2600	52.5	2.16	4. <u>12</u>	4.12	4.12	0.80	0.99	± 12.0 %

Calibration Parameter Determined in Body Tissue Simulating Media

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ^F At frequencies below 3 GHz, the validity of tissue parameters (c and σ) can be relaxed to ± 10% if liquid compensation formula is applied to

^{*} At frequencies below 3 GHz, the validity of tissue parameters (c and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (c and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

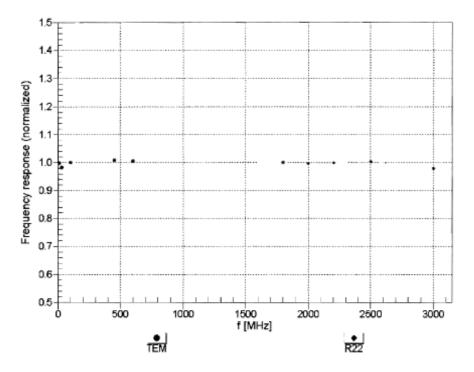
Certificate No: ES3-3225_Jan12

Page 6 of 11

Test Serv	Page 10(114)			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 11, 2012

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



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

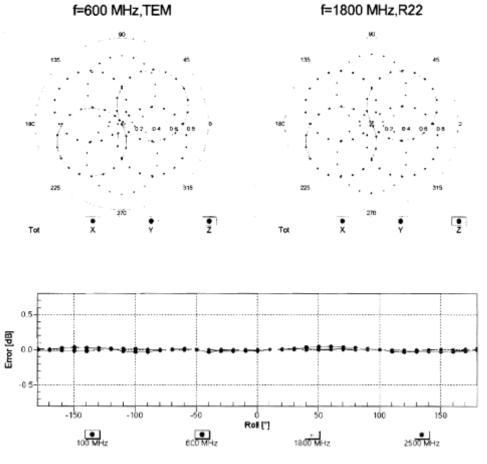
Certificate No: ES3-3225_Jan12

Page 7 of 11

Test Serv	Page 11(114)			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 11, 2012

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



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

Certificate No: ES3-3225_Jan12

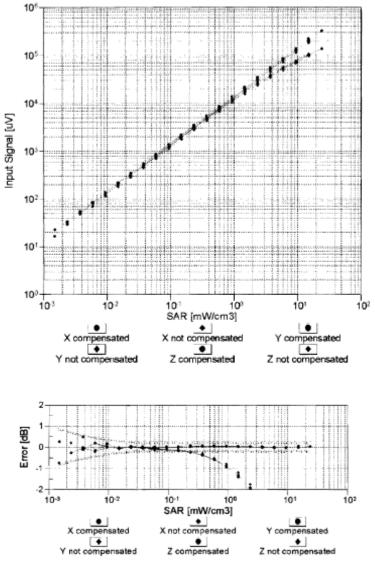
Page 8 of 11

Testing Service	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 12(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Test Serv	Appendix D for the Report	BlackBerry® Smartphone Mod	el RFA91LW SAR	Page 13(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 11, 2012

Dynamic Range f(SAR_{head}) (TEM cell , f = 900 MHz)



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

Certificate No: ES3-3225_Jan12

Page 9 of 11

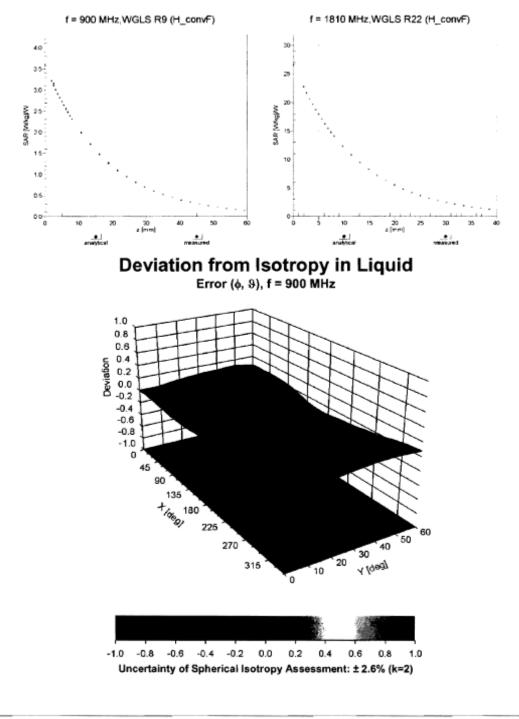
Testing Service			Page 14(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 15(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Certificate No: ES3-3225_Jan12

January 11, 2012

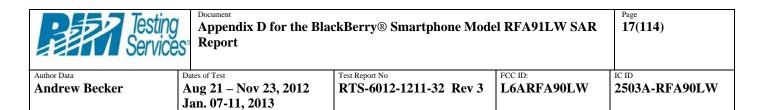
Conversion Factor Assessment



This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

Page 10 of 11

Testing Service			Page 16(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



January 11, 2012

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

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

Certificate No: ES3-3225_Jan12

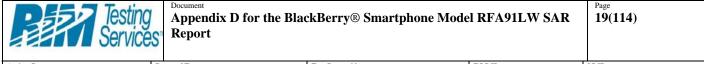
Page 11 of 11

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

字 字 S	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			FA91LW SAR 18(114)	
Data rew Becker	Dates of Test Aug 21 – No Jan. 07-11, 2		Test Report No RTS-6012-1211-32 Rev 3	FCC ID: L6ARFA90LW	іс ір 2503А-RFA90LW
	Calibration Laborate Schmid & Partner Engineering AG	-		Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura	
	Zeughausstrasse 43, 8004 Zur Accredited by the Swiss Accredit	lation Service (SAS)	Accreditation No.	Swiss Calibration Service	
	The Swiss Accreditation Servi Multilateral Agreement for the				
	Client RTS (RIM Tes	ting Services)	Certificate No: 1	X3-3592_Nov12	ġ.
				n devine fillen fillen fillen fillen fillen.	
	CALIBRATION	CERTIFICA	TE		
	0.5	miconia (conta		en e	
	Object	EX3DV4 - SN:	3592		
	Calibration procedure(s)		, QA CAL-14.v3, QA CAL-23.v4, QA C icedure for dosimetric E-field probes	CAL-25.v4	
	Calibration date:	November 14.	2012		
			national standards, which realize the physical units o e probability are given on the following pages and a		
			- F		
	All celibrations have been cond	ucted in the closed labor	atory facility, environment temperature (22 \pm 3)°C an	id humidity < 70%.	
	Calibration Equipment used (Mi	TE critical for calibration	1)		
	Primary Standards	D	Cal Date (Certificate No.)	Scheduled Calibration	
	Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Арі-13	
	Power sensor E4412A	MY41498067	29-Mar-12 (No. 217-01508)	Apr-13	
	Reference 3 dB Attenuator Reference 20 dB Attenuator	SN: S5054 (3c) SN: S5086 (20b)	27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01529)	Apr-13	_
	Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01529) 27-Mar-12 (No. 217-01532)	Apr-13 Apr-13	
	Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013, Dec11)	Dec-12	
	DAE4	SN: 660	20-Jun-12 (No. DAE4-660, Jun12)	Jun-13	
			Charle Date Ve bound	Patradiated Charals	
	Secondary Standards RF generator HP 8648C	4D US3642U01700	Check Date (in house) 4-Aug-99 (in house check Apr-11)	Scheduled Check In house check: Apr-13	_
	Network Analyzer HP 8753E	U\$37390585	18-Oct-01 (in house check Oct-12)	In house check: Out-13	
	Calibrated by:	Name Claudio Leub ier	Function Laboratory Technician	signature	
	Approved by:	Katja Pokoviç	Technical Manager	XX -	
				locupit Morenher 14, 0040	
	This self-setion and Sector shall	ant he reareduced excer	of in full without written approval of the laboratory.	Issued: November 14, 2012	

Certificate No: EX3-3592_Nov12

Page 1 of 11



Γ	Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
		Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

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



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

S

С

S

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

G	los	s	а	ł

F F

Glossary:	
TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DÇP	diode compression point
ÇF	crest factor (1/duty_cycle) of the RF signal
А, В, С	modulation dependent linearization parameters
Polarization ϕ	φ rotation around probe axis
Polarization 8	9 rotation around an axis that is in the plane normal to probe axis (at measurement center),
	i.e., 8 = 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 affect 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.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- 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 \pm 50 MHz to \pm 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.

Certificate No: EX3-3592 Nov12

Page 2 of 11

Testing Service	G Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR			Page 20(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

EX3DV4 - SN:3592

November 14, 2012

Probe EX3DV4

SN:3592

Manufactured: Calibrated:

September 18, 2006 November 14, 2012

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

Certificate No: EX3-3592_Nov12

Page 3 of 11



EX3DV4- SN:3592

November 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3592

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k≈2)
Norm $(\mu V/(V/m)^2)^A$	0.49	0.47	0.41	± 10.1 %
DCP (mV) ^B	95.2	96.1	100.6	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc [±] (k=2)
0	CW	0.00	X	0.0	0.0	1.0	121.4	±3.0 %
			Y	0.0	0.0	1.0	104.3	
			Z	0.0	0.0	1.0	109.2	

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 E²-field uncertainty inside TSL (see Pages 5 and 6). ⁹ Numerical finearization parameter: uncertainty not required. ⁶ Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field uncertainty. field value.

Certificate No: EX3-3592_Nov12

Page 4 of 11

Testing Service	Appendix D for the Bla Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 22(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	ug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3 an. 07-11, 2013		L6ARFA90LW	2503A-RFA90LW

EX3DV4- SN:3592

November 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3592

Calibration Parameter	r Determined in He	ead Tissue Simulating Media
-----------------------	--------------------	-----------------------------

f (MHz) °	Relative Permittivity	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	39.0	1.96	6.45	6.45	6.45	0.53	0.79	± 12.0 %
5200	36.0	4.66	4.73	4.73	4.73	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.28	4.28	4.28	0.44	1.80	±13.1%
5800	35.3	5.27	4.12	4.12	4.12	0.48	1.80	± 13.1 %

⁶ Frequency validity of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ⁶ At frequencies below 3 GHz, the validity of tissue parameters (ϵ and ϵ) can be relaxed to \pm 10% if siguid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and ϵ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty to indicated target tissue parameters.

Certificate No: EX3-3592_Nov12

Page 5 of 11

Testing Service	Appendix D for the Bla Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 23(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013			2503A-RFA90LW

EX3DV4-- SN:3592

November 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3592

Calibration Parameter Determined in Body Tissue Simulating Media

			-					
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	52.5	2.16	6.59	6.59	6.59	0.80	0.50	± 12.0 %
5200	49,0	5.30	4.02	4.02	4.02	0.48	1.90	± 13.1 %
5500	48.6	5.65	3.66	3.66	3.66	0.55	1.90	± 13.1 %
5800	48.2	6.00	3.57	3.57	3.57	0.57	1.90	± 13.1 %

^c Frequency validity of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ^a At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX3-3592_Nov12

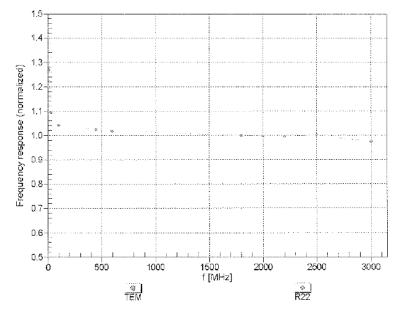
Page 6 of 11

Testing Service	Appendix D for the Bla Report	ckBerry® Smartphone Mod	el RFA91LW SAR	Page 24(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

EX3DV4-- \$N:3592

November 14, 2012

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



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

Certificate No: EX3-3592_Nov12

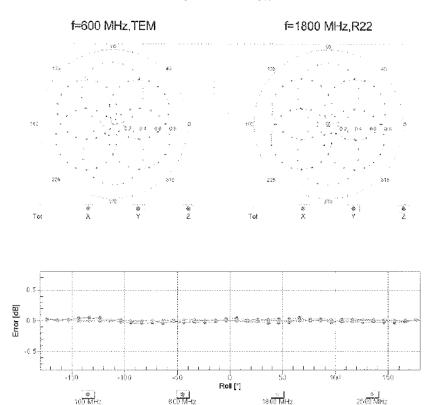
Page 7 of 11

Testing Service	Appendix D for the Bl Report	ackBerry® Smartphone Mod	el RFA91LW SAR	Page 25(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

EX3DV4-- SN:3592

November 14, 2012

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



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

Certificate No: EX3-3592_Nov12

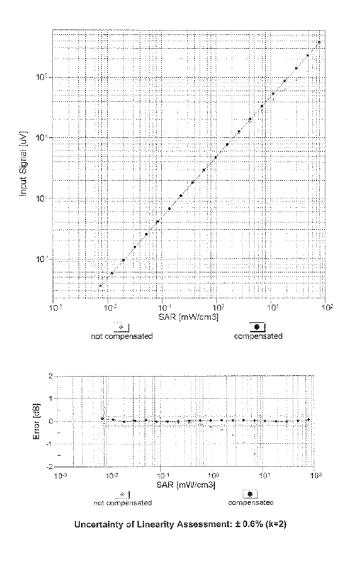
Page 8 of 11

Testing Service	Appendix D for the Blav Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 26(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

EX3DV4- \$N:3592

November 14, 2012

Dynamic Range f(SAR_{head}) (TEM cell, f = 900 MHz)



Certificate No: EX3-3592_Nov12

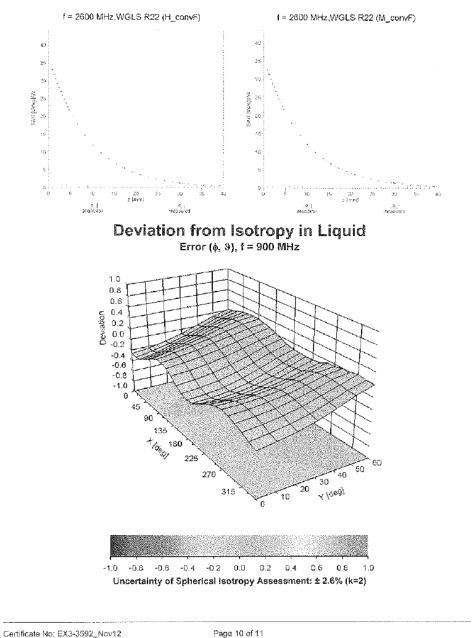
Page 9 of 11

Testing Service	Appendix D for the Bla Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 27(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

```
EX3DV4~ SN:3592
```

November 14, 2012

Conversion Factor Assessment



Testing Service	Appendix D for the Blac Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 28(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013			2503A-RFA90LW

EX3DV4- SN:3592

November 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3592

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-13.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 វេរាកា
Recommended Measurement Distance from Surface	2 mm

Certificate No: EX3-3592_Nov12

Page 11 of 11

Image with the second secon		port	BlackBerry® Smartphone Mod	
	Becker Aug 2	21 – Nov 23, 2012	Test Report No RTS-6012-1211-32 Rev 3	FCC ID: IC ID L6ARFA90LW IC ID 2503A-RFA9
Tabulas Accreditation Service is one of the signatories outfittedes Term The (RUM Testing, Service) Calculastication defaults on the signatories Centers in: X2-X2-X2-X2-X2-X2-X2-X2-X2-X2-X2-X2-X2-X	Schmid & Partner Engineering AG	-		Service suisse d'étalonnage Servizio svizzero di taratura
CALIBRATION CERTIFICATE Oper EX30V4 + SN13548 Calibration procedure(r) CACAC-01x8 CACAC-14 x9, OACAC-23 x9, OACAC-25 x8, Calibration procedure(r) Calibration procedure(r) CACAC-01x8 CACAC-14 x9, OACAC-23 x9, OACAC-25 x8, Calibration procedure(r) Calibration procedure(r) CALIBRATION CERTIFICATE Main Calibration procedure(r) CALIBRATION CERTIFICATE Calibration procedure(r) CALIBRATION CERTIFICATE Main Calibration data CALIBRATION CERTIFICATE Main Calibration data Main Calibration for Calibration for measurements (R) Calibrations have been conducted in the closed laboratory facility: environment temperature (22 1 2) Chanturity - 7012 Main Calibration Equipment used (M&ET critical for calibration Phoner materificatel 1918 Main 1908 21701372) Apr-12 Main Calibration Equipment used (M&ET critical for calibration Main 1908 21701372) Apr-12 Main Calibration Existical 200001 24 Main 1100 21701372) Apr-12 Apr-12	The Swiss Accreditation Service	ce is one of the signatories	s to the EA	4o.: SCS 108
Object EX3DV4 - SN:35548 Calibration procedure(s) QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration share been conducted in the closed laboratory facility: environment temperature (22 ± 3)*C and humidity < 70%.	Client RTS (RIM Tes	ting Services)	Certificate No:	EX3-3548_Jan12
Object EX3DV4 - SN:35548 Calibration procedure(s) QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration certificate documents the traceability onational standards, which realize the physical units of measurements (6)). The measurements and the uncertainlies with confidence probability are given on the following pages and are part of the certificate. At calibration shave been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards D Primary Standards D Advected 308 Menuator SN: 55054 (20) Patternice 20 dB Altenuator SN: 55054 (20) Patternice 20 dB Altenuator<	CALIBRATION	CERTIFICAT		4
Calibration procedure(s) DA CAL-91'v8; QA CAL-14.v3; QA CAL-23.v4, OA CAL-25.v4 Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration certificate documents the traceability to national standards, which reakze the physical units of measurements (s). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the cartificate. All calibration shave been conducted in the closed laboratory facility: environment temperature (22 ± 3)'C and humidity < 70%. Calibration Equipment used (MRTE critical for calibration) Primary Standards 10 Prover mater E4412A MY 1409087 All value 11 (No. 217.01372) Apr-12 Reference 2 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator 5N: 55058 (20) 29-Mar-11 (No. 217.01370) Apr-12 Reference 3 0.8 Altenuator	CALCED MATLEONS	SERVICIAN		
Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (st). The measurements and the uncertainlies with confidence probability are given on the following pages and are part of the certificate. All calibration shave been conducted in the closed laboratory facility: environment temparature (22 ± 3)°C and humidity < 70%.	Object	EX3DV4 - SN:35	48	nthan an a
Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainlies with confidence probability are given on the following pages and are part of the certificate. All calibration shave been conducted in the closed laboratory facility: environment temparature (22 ± 3)°C and humidity < 70%.				
Calibration procedure for dosimetric E-field probes Calibration date: January 14; 2012 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (st). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibration shave been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.	Calibration procedure(s)	QA CAL-01.v8, C	A CAL-14.v3, QA CAL-23.v4, QA	CAL-25.v4
Calibration date: Jmuary 14, 2012 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (st). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. At calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.				The second s
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.		150	and the second second	A STATE OF STATE OF STATE
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.			elandineza, i., el-eletranov el filosopou de Filosopero e el filozoperez del	2004/deaters #C-12040466340anaani, 42*
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.	Calibration date:	January 14: 2012	AND CLASSES AND COMPACTIONS AND COMPACT	
Primary Standards ID Cal Date (Certificate No.) Scheduled Calibration Power metter E4419B GB41293874 31-Mar-11 (No. 217-01372) Apr-12 Power sensor E4412A MY41498087 31-Mar-11 (No. 217-01372) Apr-12 Reference 3 dB Attenuator SN: S5054 (3c) 29-Mar-11 (No. 217-01389) Apr-12 Reference 20 dB Attenuator SN: S5096 (20b) 29-Mar-11 (No. 217-01387) Apr-12 Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. 217-01370) Apr-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3842U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Calibrated by: Name Function Signature Approved by: Nisk Kueter Dusility Manager Museuton <th>. The transformation and the bill</th> <th>and the second sec</th> <th>ensued are suren on the renowing bages and</th> <th>are part of the contribute.</th>	. The transformation and the bill	and the second sec	ensued are suren on the renowing bages and	are part of the contribute.
Power meter E4419B GB41293874 31-Mar-11 (No. 217-01372) Apr-12 Power sensor E4412A MY41490087 31-Mar-11 (No. 217-01372) Apr-12 Reference 3 dB Attenuator SN: S5054 (3c) 29-Mar-11 (No. 217-01369) Apr-12 Reference 20 dB Attenuator SN: S5096 (20b) 29-Mar-11 (No. 217-01367) Apr-12 Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. ES3-3013_Dec11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Cct-11) In house check: Oct-12 Approved by: Name Function Signature Approved by: Niels Kuater Ousility Manager August			y facility: environment temperature (22 \pm 3)°C \approx	and humidity < 70%.
Power meter E4419B GB41293874 31-Mar-11 (No. 217-01372) Apr-12 Power sensor E4412A MY41498087 31-Mar-11 (No. 217-01372) Apr-12 Reference 3 dB Attenuator SN: S5054 (3c) 29-Mar-11 (No. 217-01389) Apr-12 Reference 3 dB Attenuator SN: S5098 (20b) 29-Mar-11 (No. 217-01387) Apr-12 Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Cot-11) In house check: Oct-12 Approved by: Name Function Signature Approved by:<			y facility: environment temperature (22 \pm 3)°C ϵ	and humidity < 70%.
Power sensor E4412A MY41498087 31-Mar-11 (No. 217-01372) Apr-12 Reference 3 dB Altenuator SN: S5054 (3c) 29-Mar-11 (No. 217-01369) Apr-12 Reference 20 dB Attenuator SN: S5086 (20b) 29-Mar-11 (No. 217-01367) Apr-12 Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01367) Apr-12 Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. ES3-3013_Dec11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Calibrated by: Name Function Signature Approved by: Niels Kuster Ousility Manager Aug-04	Calibration Equipment used (M8	TE critical for calibration)		
Reference 20 dB Attenuator SN: \$5086 (20b) 29-Mar-11 (No. 217-01367) Apr-12 Reference 30 dB Attenuator SN: \$5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. ES3-3013_Dec11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Cot-12 Name Function Signature Approved by: Nais Kuster Quality Manager	Calibration Equipment used (M8 Primary Standards	STE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration
Reference 30 dB Attenuator SN: S5129 (30b) 29-Mar-11 (No. 217-01370) Apr-12 Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. ES3-3013_Dec11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Cdt-11) In house check: Cdt-12 Name Function Signature Calibrated by: Name Technical Manager Approved by: Niels Kuster Quality Manager Approved by: Niels Kuster	Calibration Equipment used (M8 Primary Standards Power meter E4419B	STE critical for calibration)	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372)	Scheduled Calibration Apr-12
Reference Probe ES3DV2 SN: 3013 29-Dec-11 (No. ES3-3013_Dec11) Dec-12 DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3842U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Name Technical Manager Approved by: Niels Kuster Ousility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A	STE critical for calibration)	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372)	Scheduled Calibration Apr-12 Apr-12
DAE4 SN: 654 3-May-11 (No. DAE4-654_May11) May-12 Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Katja Pokovic Technical Manager Approved by: Niels Kuster Queility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator	ID GB41293874 MY41498087 SN: S5054 (3c)	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369)	Scheduled Calibration Apr-12 Apr-12 Apr-12
Secondary Standards ID Check Date (in house) Scheduled Check RF generator HP 8648C US3842U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Katja Pokovic Technical Manager Approved by: Niels Kuster Quality Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator	TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b)	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12
RF generator HP 8648C US3842U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Katja Pokovic Technical Manager Approved by: Niels Kuster Oueility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 3013	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12
RF generator HP 8648C US3842U01700 4-Aug-99 (in house check Apr-11) In house check: Apr-13 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Katja Pokovic Technical Manager Approved by: Niels Kuster Oueility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 3013	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12
Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-11) In house check: Oct-12 Name Function Signature Calibrated by: Katja Pokovic Technical Manager Approved by: Niels Kuster Ousility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 20 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5086 (20b) SN: S5129 (30b) SN: 3013 SN: 654	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12
Calibrated by: Name Function Signature Approved by: Niels Kuster Oueility Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5096 (20b) SN: S5129 (30b) SN: 3013 SN: 654 ID ID	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check
Calibrated by: Katja Pokovic Technical Manager Approved by: Nials Kuster Quality Manager	Calibration Equipment used (M8 Primary Standards Power meter E4419B 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	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: 6512 SN: 654 ID US3642U01700	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13
/ V. 1985	Calibration Equipment used (M8 Primary Standards Power meter E4419B 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	ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: 6512 SN: 654 ID US3642U01700	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11)	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13
having barrier (4, 2010	Calibration Equipment used (M8 Primary Standards Power meter E4419B 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 Network Analyzer HP 8753E	ID GB41293874 MY41490087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: 3013 SN: 654 ID US3642U01700 US37390585 Name	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Oct-01 (in house check Apr-11) Function	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13 In house check: Oct-12
Issued: January 14, 2012	Calibration Equipment used (M8 Primary Standards Power meter E4419B 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 Calibrated by:	ID GB41293874 MY41490087 SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: 3013 SN: 654 ID US3642U01700 US37390585 Name Katja, Pokovic Name	Cal Date (Certificate No.) 31-Mar-11 (No. 217-01372) 31-Mar-11 (No. 217-01372) 29-Mar-11 (No. 217-01369) 29-Mar-11 (No. 217-01367) 29-Mar-11 (No. 217-01370) 29-Dec-11 (No. ES3-3013_Dec11) 3-May-11 (No. DAE4-654_May11) Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Oct-01 (in house check Oct-11) Function Technical Manager	Scheduled Calibration Apr-12 Apr-12 Apr-12 Apr-12 Apr-12 Dec-12 May-12 Scheduled Check In house check: Apr-13 In house check: Oct-12

Certificate No: EX3-3548_Jan12

Page 1 of 11

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report Report			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

FCC ID: Author Data Dates of Test Test Report No Andrew Becker Aug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3 Jan. 07-11, 2013

Calibration Laboratory of

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



Schweizerischer Kalibrierdienst s Service suisse d'étalonnage С

Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

s

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

olossuly.	
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 ϕ	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 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 affect 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.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- 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.

Certificate No: EX3-3548_Jan12

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

EX3DV4 - SN:3548

January 14, 2012

Probe EX3DV4

SN:3548

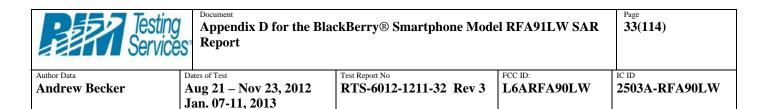
Manufactured: Calibrated:

November 16, 2004 January 14, 2012

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

Certificate No: EX3-3548_Jan12

Page 3 of 11



EX3DV4- SN:3548

January 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3548

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	0.36	0.44	0.43	± 10.1 %
DCP (mV) ⁸	101.1	99.7	97.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	93.0	±2.5 %
			Y	0.00	0.00	1.00	100.4	
			Z	0.00	0.00	1.00	107.4	

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 E²-field uncertainty inside TSL (see Pages 5 and 6).
^B Numerical linearization parameter: uncertainty not required.
^E Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: EX3-3548_Jan12

Page 4 of 11

Testing Service	Appendix D for the Bla Report	Page 34(114)		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



DASY/EASY - Parameters of Probe: EX3DV4 - SN:3548

f (MHz) ^C	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	39.0	1.96	7.15	7.15	7.15	0.34	1.00	± 12.0 %
5200	36.0	4.66	4.98	4.98	4.98	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.80	4.80	4.80	0.42	1.80	± 13.1 %
5800	35.3	5.27	4.44	4.44	4.44	0.50	1.80	± 13.1 %

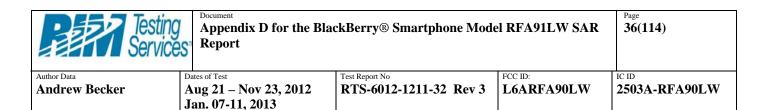
Calibration Parameter Determined in Head Tissue Simulating Media

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

⁷ At frequencies below 3 GHz, the validity of tissue parameters (*κ* and *σ*) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (*κ* and *σ*) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX3-3548_Jan12

Page 5 of 11



EX3DV4- SN:3548

January 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3548

Unct. Relative Conductivity Depth f (MHz)^C Permittivity^F ConvF Z (S/m) ConvF X ConvF Y Alpha (mm) (k=2) 7.40 7.40 0.80 0.64 ± 12.0 % 2600 52.5 2.16 7.40 5200 49.0 5.30 4.55 4.55 4.55 0.58 1.90 ± 13.1 % 5500 48.6 5.65 4.08 4.08 4.08 0.58 1.90 ± 13.1 % 5800 48.2 6.00 4.19 4.19 4.19 0.58 1.90 ± 13.1 %

Calibration Parameter Determined in Body Tissue Simulating Media

^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ^F At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if figuid compensation formula is applied to

^c At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX3-3548_Jan12

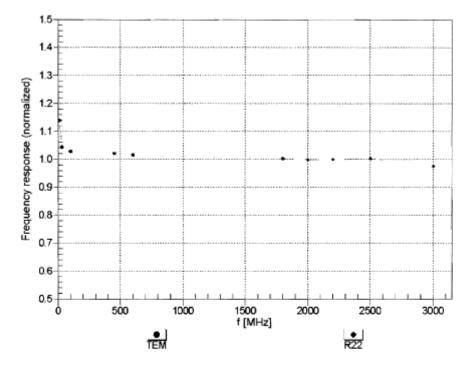
Page 6 of 11

Testing Service	Appendix D for the Bla Report	ackBerry® Smartphone Mod	el RFA91LW SAR	Page 37(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Test Serv	Appendix D for the B Report	lackBerry® Smartphone Mod	el RFA91LW SAR	Page 38(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 14, 2012

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



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

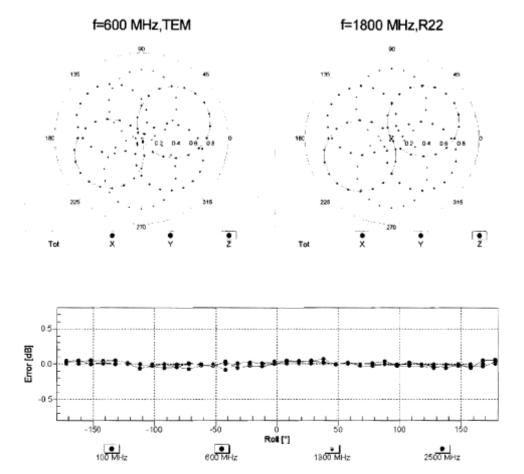
Page 7 of 11

Testing Service	Appendix D for the Bla Report	ackBerry® Smartphone Mod	el RFA91LW SAR	Page 39(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Tes Serv	Appendix D for the Report	BlackBerry® Smartphone Mod	el RFA91LW SAR	Page 40(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 14, 2012

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



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

Certificate No: EX3-3548_Jan12

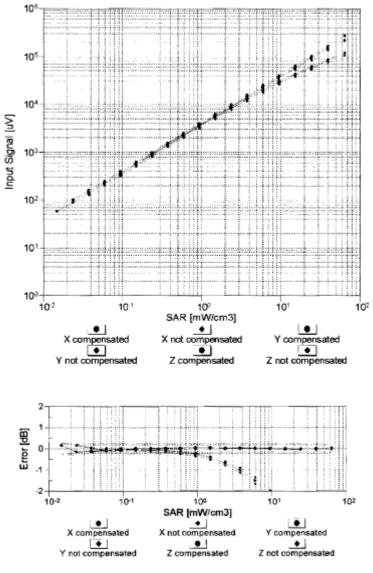
Page 8 of 11

Testing Service	Appendix D for the Bla Report	ackBerry® Smartphone Mode	el RFA91LW SAR	Page 41(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testine Service	Appendix D for the Bl Report	ackBerry® Smartphone Mod	el RFA91LW SAR	Page 42(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

January 14, 2012

Dynamic Range f(SAR_{head}) (TEM cell , f = 900 MHz)



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

Certificate No: EX3-3548_Jan12

Page 9 of 11

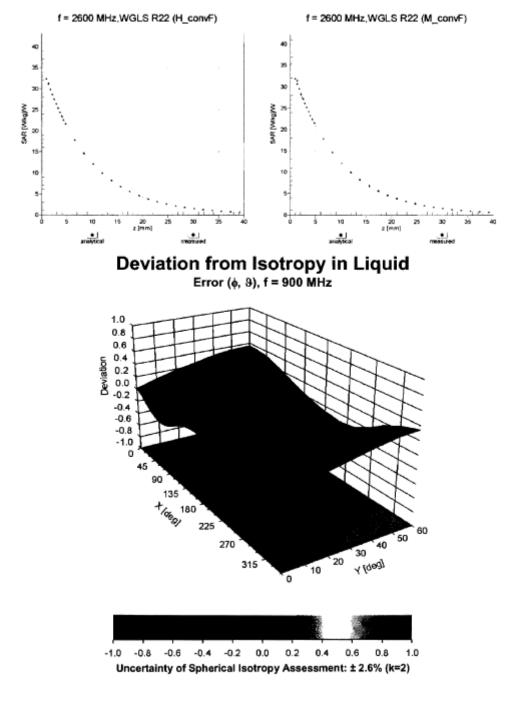
Testing Service	Appendix D for the Bla Report	ackBerry® Smartphone Mode	el RFA91LW SAR	Page 43(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Appendix D for the Blav Report	ckBerry® Smartphone Mode	el RFA91LW SAR	Page 44(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Certificate No: EX3-3548_Jan12

January 14, 2012

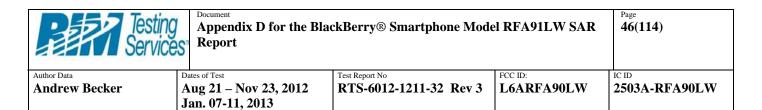
Conversion Factor Assessment



This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

Page 10 of 11

Testing Service	Appendix D for the Bla Report	ackBerry® Smartphone Mod	el RFA91LW SAR	Page 45(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



January 14, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3548

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	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Certificate No: EX3-3548_Jan12

Page 11 of 11

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

	Dates of Test Aug 21 – Jan. 07-1	Nov 23, 2012 1, 2013	Test Report No RTS-6012-1211-32 Rev 3	FCC ID: L6ARFA90LW	IC ID 2503A-RFA90
Calibration La Schmid & Part	boratory		GNISS S	S Schweizerischer Kalibrie	
Engineering A Zeughausstrasse 43,	AG	Switzerland		C Service suisse d'étalonna Servizio svizzero di tarati S Swiss Calibration Service	ura
	tion Service is	on Service (SAS) is one of the signatorie ognition of calibration	s to the EA	ion No.: SCS 108	
Client RIM	(Certificate	No: D750V3-1021_Jan	11
CALIBRAT	TION CI	ERTIFICATE			
Object		D750V3 - SN: 10	21	1.12	
Calibration procedure	e(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits		
			and the state of t		
	icate documen	the traceability to nati	onal standards, which realize the physical	units of measurements (SI).	
This calibration certif The measurements a All calibrations have	icate documen and the uncerta been conducte	its the traceability to nati ainties with confidence p ad in the closed laborator		units of measurements (SI). and are part of the certificate.	
This calibration certif The measurements a All calibrations have Calibration Equipmen	icate documen and the uncerta been conducte	its the traceability to nati ainties with confidence p ad in the closed laborator critical for calibration}	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%.	
This calibration certif The measurements a All calibrations have	icate documen and the uncerta been conducte nt used (M&TE	its the traceability to nati ainties with confidence p ad in the closed laborator	onal standards, which realize the physical robability are given on the following pages	units of measurements (SI). and are part of the certificate.	1
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards	icate documen and the uncerta been conducte nt used (M&TE	its the traceability to nati ainties with confidence p ad in the closed laborator critical for calibration} ID #	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration	1
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Atta	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11	n
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Atta Type-N mismatch co	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11	1
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Atta	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11	n
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Attr Type-N mismatch co Reference Probe ES DAE4 Secondary Standards	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination 3DV3 s	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 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)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check	
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Attr Type-N mismatch co Reference Probe ES DAE4 Secondary Standards Power sensor HP 84	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination 3DV3 8 81A	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 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-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)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-1	11
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Attr Type-N mismatch co Reference Probe ES DAE4 Secondary Standard	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination 3DV3 8 81A 81A 81A 81A	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 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)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check	11
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Attr Type-N mismatch co Reference Probe ES DAE4 Secondary Standard Power sensor HP 84 RF generator R&S S Network Analyzer HF	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination 3DV3 8 81A 81A 81A 81A	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	onal standards, which realize the physical robability are given on the following pages ry 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. 217-01162) 30-Mar-10 (No. 217-01162) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. 253-3205_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) 18-Oct-01 (in house check Oct-09) 18-Oct-01 (in house check Oct-10) Function	units of measurements (SI). and are part of the certificate. 3)*C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-1 In house check: Oct-1	11
This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-4/ Power sensor HP 84 Reference 20 dB Attr Type-N mismatch co Reference Probe ES DAE4 Secondary Standard Power sensor HP 84 RF generator R&S S	icate documen and the uncerta been conducte nt used (M&TE 42A 81A enuator mbination 3DV3 8 81A 81A 81A 81A	the traceability to nati ainties with confidence p ed in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 601 ID # MY41092317 100005 US37390585 S4206	onal standards, which realize the physical robability are given on the following pages ry facility: environment temperature (22 ± 3 Cal Date (Certificate No.) 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. 253-3205_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) 18-Oct-01 (in house check Oct-10)	units of measurements (SI). and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Scheduled Check In house check: Oct-1 In house check: Oct-1	11

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 48(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

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

Accreditation No.: SCS 108

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

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna ٠ connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the ٠ nominal SAR result.

Certificate No: D750V3-1021_Jan11



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	2.12 mW / g
SAR normalized	normalized to 1W	8.48 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	8.36 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 mW / g
SAR normalized	normalized to 1W	5.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	5.45 mW /g ± 16.5 % (k=2)

Certificate No: D750V3-1021_Jan11



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.1 Ω - 1.7 jΩ
Return Loss	- 29.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns
Electrical soluty (one anotherly	1000110

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, 2010

Certificate No: D750V3-1021_Jan11

Page 4 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



DASY5 Validation Report for Head TSL

Date/Time: 05.01.2011 15:51:17

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1021

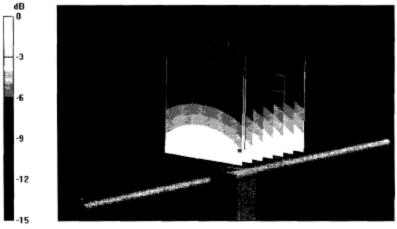
Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1 Medium: HSL750 Medium parameters used: f = 750 MHz; σ = 0.91 mho/m; ϵ_r = 42.3; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.37, 6.37, 6.37); 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 Build (401)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250mW; dip=15mm; dist=3.0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

dx=5mm, dy=5mm, dz=5mm Reference Value = 53.5 V/m; Power Drift = -0.00432 dB Peak SAR (extrapolated) = 3.24 W/kg SAR(1 g) = 2.12 mW/g; SAR(10 g) = 1.38 mW/g Maximum value of SAR (measured) = 2.48 mW/g





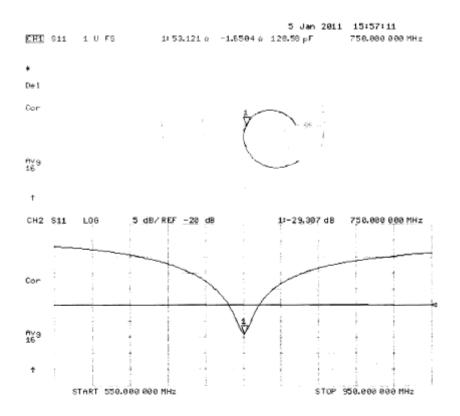
Cortificate No: D750V2-1021 Lop11

Dago E of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testi Servi	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 55(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1021_Jan11

Page 6 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Dates of Test Aug 21 – I Jan. 07-11	Nov 23, 2012 , 2013	Test Report No RTS-6012-1211-32 Rev 3	FCC ID: L6ARFA90LW	IC ID 2503A-RFA90]
Calibration Laborator Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zuric	-		Schweizerischer Kalibrierdie Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service	inst
Accredited by the Swiss Accredita The Swiss Accreditation Servic Multilateral Agreement for the r	e is one of the signatorie	s to the EA	on No.: SCS 108	
Client RTS (RIM Test	ing Services)	Certificate I	No: D835V2-446_Jan11	
CALIBRATION C	ERTIFICATI			
Object	D835V2 - SN: 44	16		
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits		
Calibration date:	January 21, 201	n (1998), seedaaliina Naadii Safaa (1999), seedaalii		
This calibration certificate docum The measurements and the unce All calibrations have been condu	ents the traceability to nat entainties with confidence p cted in the closed laborato	1 ional standards, which realize the physical u probability are given on the following pages a ny facility: environment temperature (22 ± 3)	and are part of the certificate.	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M&	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration)	ional standards, which realize the physical u probability are given on the following pages any facility: environment temperature (22 \pm 3)	and are part of the certificate.	
This calibration certificate docum The measurements and the unce All calibrations have been condu	ents the traceability to nat entainties with confidence p cted in the closed laborato	ional standards, which realize the physical u robability are given on the following pages a	and are part of the certificate.	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration)	ional standards, which realize the physical u probability are given on the following pages a ny facility: environment temperature (22 ± 3) Cal Date (Certificate No.)	and are part of the certificate. °C and humidity < 70%. Scheduled Calibration	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	tents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	ional standards, which realize the physical u robability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158)	and are part of the certificate. PC and humidity < 70%. Scheduled Calibration Oct-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	ional standards, which realize the physical u robability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162)	and are part of the certificate.)°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205	ional standards, which realize the physical u probability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10)	and are part of the certificate. (*C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	ional standards, which realize the physical u robability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162)	and are part of the certificate. (°C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205	ional standards, which realize the physical u probability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10)	and are part of the certificate. (*C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601	ional standards, which realize the physical u probability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10)	and are part of the certificate. PC and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	ional standards, which realize the physical u probability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01152) 30-Apr-10 (No. 23-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house)	and are part of the certificate. PC and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	ents the traceability to natertainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317	ional standards, which realize the physical u probability are given on the following pages a ry facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 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. 23-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 18-Oct-02 (in house check Oct-09)	and are part of the certificate. PC and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Scheduled Check In house check: Oct-11	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 301 ID # MY41092317 100005	ional standards, which realize the physical u robability are given on the following pages a ry facility: environment temperature (22 ± 3) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 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)	and are part of the certificate. PC and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11	· · · · · ·



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

Author Data	Dates of Test	Test Report No	FCC ID:
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW
	Jan. 07-11, 2013		

IC ID 2503A-RFA90LW

Calibration Laboratory of

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





s

C Service suisse d'étalonnage

Schweizerischer Kalibrierdienst

- Servizio svizzero di taratura Servizio Servico
 - Swiss Calibration Service

Accreditation No.: SCS 108

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

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

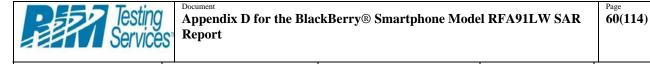
Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D835V2-446_Jan11

Page 2 of 6

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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

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



Au	thor Data	Dates of Test	Test Report No	FCC ID:	IC ID
A		Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
		Jan. 07-11, 2015			

DASY5 Validation Report for Head TSL

Date/Time: 21.01.2011 10:18:05

Test Laboratory: SPEAG, Zurich, Switzerland

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

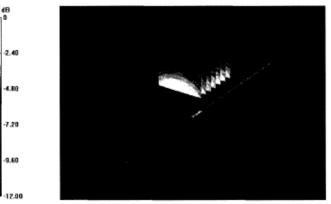
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL900 Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ϵ_r = 41.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



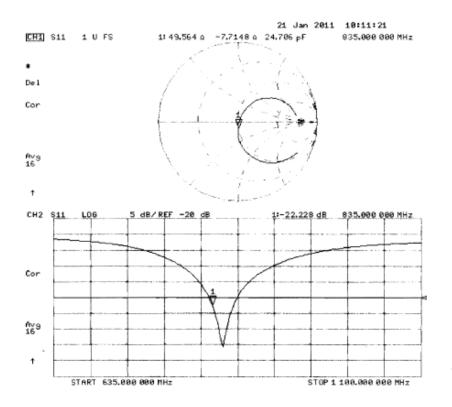
 $0 \, dB = 2.790 \, mW/g$

Certificate No: D835V2-446_Jan11

Page 5 of 6

Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 63(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

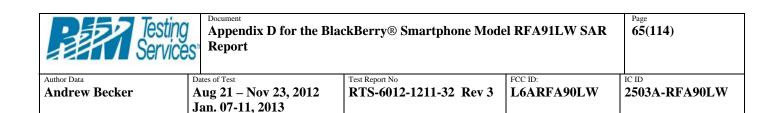
Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan11

Page 6 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		Page 64(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



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



SHISS	S	Sci
. [m]	ž	Sei
ç 🖓 z)	C	Se
C C Z	S	Sw

ichweizerischer Kalibrierdienst ervice suisse d'étalonnage iervizio svizzero di tareture iwiss Calibration Service

Accreditation No.: SCS 108

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

Client RTS (RIM Testing Services)

Certificate No: D835V2-4d043_Apr11

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d	043	
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
Calibration date:	April 07, 2011		
The measurements and the unce	tainties with confidence p	onal standards, which realize the physical un robability are given on the following pages ar ny facility: environment temperature $(22 \pm 3)^9$	id are part of the cartificate.
Calibration Equipment used (M&T	E prifical for calibration)		
Primary Standards	10 #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	G837480704	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)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES9-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	10 H	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
Calibrated by:	Name Jeton Kasheti	Function Laboratory Technician	Signature
Approved by:	Kalja Pokovic	Technical Manager	Jele Kag
This collection partitions about a	t he repund and assort in	full without written approval of the laboratory	Issued: April 7, 2011
THIS CANCILIEON CERTIFICATE SNAT IN	a os astroancea except lu	i full without written approval of the laboratory	
Certificate No: DB35V2-4d043	Apr11	Page 1 of 6	

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		Page 66(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

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



- S Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura
- Servizio svizzero di teretura 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:

alussaly.	
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: D995V2-4d043_Apr11

Page 2 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 68(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 69(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
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	40.6 ± 6 %	0.88 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	X ans H	

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.33 mW / g
SAR normalized	normalized to 1W	9.32 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.43 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR normalized	normalized to 1W	6.08 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.14 mW /g ± 16.5 % (k=2)

Certificate No: D835V2-4d043_Apr11

Page 3 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 70(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 71(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.9 Ω - 3.4 jΩ
Return Loss	- 27.2 dB

General Antenna Parameters and Design

Ì	Electrical Delay (one direction)	1.391 ns
		1

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.

Design Modification by End User

The dipole has been modified with Tetion Rings (TR) placed within identified markings close to the end of each dipole arm. Calibration has been performed with TR attached to the dipole.

Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	April 07, 2006	

Certificate No: D835V2-4d043_Apr11

Page 4 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 72(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



DASY5 Validation Report for Head TSL

Jan. 07-11, 2013

Date/Time: 07.04.2011 09:28:21

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d043

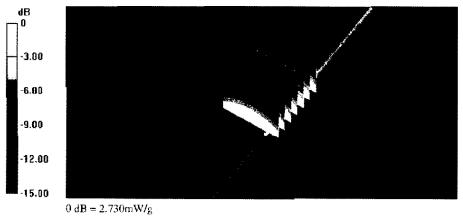
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL900 Medium parameters used: f = 835 MHz; σ = 0.88 mho/m; ϵ_r = 40.6; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Pin=250 mW /d=15mm/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.201 V/m; Power Drift = 0.07 dB Peak SAR (extrapolated) = 3.504 W/kg SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/g Maximum value of SAR (measured) = 2.730 mW/g



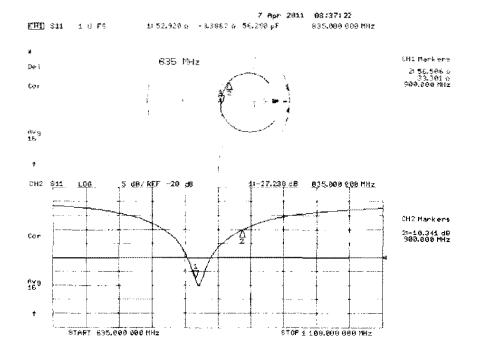
Certificate No: D835V2-4d043_Apr11

Page 5 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3 L6ARFA90LW 2 Jan. 07-11, 2013			2503A-RFA90LW

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



Certificate No: D935V2-4d043_Apr11

Page 6 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3 L6ARFA90LW 2 Jan. 07-11, 2013			2503A-RFA90LW

Testing Service	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 77(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

	Services Report			FOGID	
ew Beo	cker Aug 21 – Jan. 07-1	Nov 23, 2012 1, 2013	Test Report No RTS-6012-1211-32 Rev 3	FCC ID: L6ARFA90LW	2503A-RFA90L
	Calibration Laborator Schmid & Partner Engineering AG	y of		Service suisse d'étalonnag Servizio svizzero di taratur	ge
	Zeughausstrasse 43, 8004 Zuricl	h, Switzerland	Maddall' MORATE S	Swiss Calibration Service	
	Accredited by the Swiss Accredita The Swiss Accreditation Service Multilateral Agreement for the re	e is one of the signatorie	s to the EA	n No.: SCS 108	
	-	ng Services)		a: D1900V2-545_Jan1	1
	CALIBRATION C	ERTIFICATE		a salahan salah	
	Object	D1900V2 - SN: 5	45 . Andrew - Antonie Antonie (* 1949)		
	Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits		
		1997 - A. S. W. 1997 - 1997	And the second	en en antier a strategier et a	
	Calibration date: This calibration certificate docum		onal standards, which realize the physical ur	nits of measurements (SI).	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc	ents the traceability to nati rtainties with confidence p sted in the closed laborator		nd are part of the certificate.	•
	This calibration certificate docum The measurements and the unce	ents the traceability to nati rtainties with confidence p sted in the closed laborator	onal standards, which realize the physical ur robability are given on the following pages ar	nd are part of the certificate.	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards	ents the traceability to nati rtainties with confidence p sted in the closed laborator FE critical for calibration)	onal standards, which realize the physical ur robability are given on the following pages a ry facility: environment temperature (22 ± 3)° Cal Date (Certificate No.)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A	ents the traceability to nati rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704	onal standards, which realize the physical ur robability are given on the following pages a ry facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A	ents the traceability to nati rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704 US37292783	onal standards, which realize the physical ur robability are given on the following pages a ry facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A	ents the traceability to nati rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704	onal standards, which realize the physical ur robability are given on the following pages ar ty facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	ents the traceability to nati rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	onal standards, which realize the physical ur robability are given on the following pages a ry facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ents the traceability to nati rtainties with confidence p cted in the closed laborator TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	onal standards, which realize the physical ur robability are given on the following pages ar ty facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	ents the traceability to nati rtainties with confidence p cted in the closed laborator TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5087.2 / 06327 SN: 3205	onal standards, which realize the physical ur robability are given on the following pages ar ty facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10)	C and humidity < 70%. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	ents the traceability to nati rtainties with confidence p sted in the closed laborator TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601	onal standards, which realize the physical ur robability are given on the following pages ar by facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10)	C and humidity < 70%. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11	1
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ents the traceability to nati rtainties with confidence p sted in the closed laborator TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	onal standards, which realize the physical ur robability are given on the following pages ar y facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house)	d are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check	
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	ents the traceability to nati rtainties with confidence p sted in the closed laborator TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # ID # MY41092317	onal standards, which realize the physical ur robability are given on the following pages ar y facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01162) 30-Mar-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 18-Oct-02 (in house check Oct-09)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Jun-11 Scheduled Check In house check: Oct-11	1
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ents the traceability to nati- rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	onal standards, which realize the physical ur robability are given on the following pages ar y facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-0158) 30-Mar-10 (No. 217-01162) 30-Apr-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) 18-Oct-01 (in house check Oct-09) 18-Oct-01 (in house check Oct-10)	And are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11	1
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ents the traceability to nati- rtainties with confidence p sted in the closed laborator (E critical for calibration) (D # (B37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 (D # (MY41092317 100005 US37390585 S4206	onal standards, which realize the physical ur robability are given on the following pages at y facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 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. 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) 18-Oct-01 (in house check Oct-10)	And are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11	1
	This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ents the traceability to nati- rtainties with confidence p sted in the closed laborator FE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	onal standards, which realize the physical ur robability are given on the following pages at y facility: environment temperature (22 ± 3)° Cal Date (Certificate No.) 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-0158) 30-Mar-10 (No. 217-01162) 30-Apr-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) 18-Oct-01 (in house check Oct-09) 18-Oct-01 (in house check Oct-09) 18-Oct-01 (in house check Oct-10) Function	And are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11	1



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

IC ID

Author Data	Dates of Test	Test Report No
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3
	Jan. 07-11, 2013	

Calibration Laboratory of

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



- Schweizerischer Kalibrierdienst s Service suisse d'étalonnage
- с
- 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 ٠ 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

Page 2 of 6

This report shall NOT be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

Servizio svizzero di taratura



Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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

SAR averaged over 1 cm ³ (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	normalized to 1W	40.0 mW /g ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.26 mW / g
SAR normalized	normalized to 1W	21.0 mW / g

Certificate No: D1900V2-545_Jan11



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker		RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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

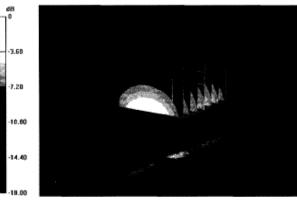
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε _r = 38.6; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



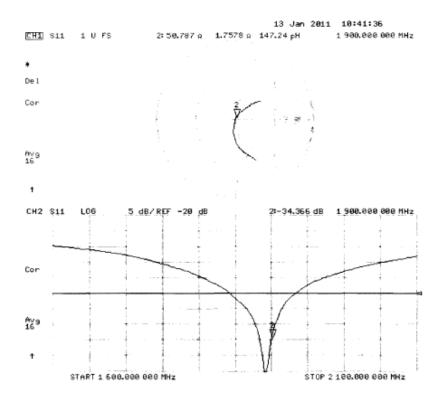


Certificate No: D1900V2-545_Jan11

Page 5 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 83(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545_Jan11

Page 6 of 6



Dates of Test	Test Report No	FCC ID:	IC ID
Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Aug 21 – Nov 23, 2012	Aug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3	Aug 21 – Nov 23, 2012 RTS-6012-1211-32 Rev 3 L6ARFA90LW

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



SNISS

Schweizerlacher Kalibrierdienst S Service suisse d'étalonnage Ĉ Servizio svizzero di laratura 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 Muitilateral Agreement for the recognition of calibration certificates

RTS (RIM Testing Services) Client

Certificate No: D1900V2-5d075_Apr11

Object	D1900V2 - SN: 5d075				
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits				
talibration data:	April 5, 2011				
"he measurements and the unco	ertainties with confidence p icted in the closed laborato	ional standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature (22 ± 3)*(d are part of the certificate,		
TSURATION ECONDUCIAN ORDER (NO					
Baims can a Dimetoire acto	10.4	Cal Data (Cartificate No.)	Cohod Jed Colleman		
	ID #	Cal Date (Gerüficate No.)	Scheduled Calibration		
ower meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11		
^a ower meter EPM-442A Power sensor HP 8481A	GB37480704 U\$37292783	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266)	Oct-11 Oct-11		
Power meler EPM-442A Power sensor HP 9481A Reference 20 dB Attenuator	GB37480704 U\$37292783 SN: 5086 (20g)	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01286) 29-Mar-11 (No. 217-01368)	Oct-11 Oct-11 Apr-12		
Power meler EPM-442A Power sensor HP 8481A Pelerence 20 dB Attenuator Type-N mismatch combination	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 05327	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	Oct-11 Oct-11 Apr-12 Apr-12		
Power meler EPM-442A Power sensor HP 8481A Pelerence 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	GB37480704 U\$37292783 SN: 5086 (20g)	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01286) 29-Mar-11 (No. 217-01368)	Oct-11 Oct-11 Apr-12		
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reterence Probe ES3DV3 DAE4	GB37480704 U\$37292783 SN: 5086 (20g) SN: 5047.2708327 SN: 3205	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 30-Apr-10 (No. ES3-3205_Apr10)	Oct-11 Oct-11 Apr-12 Apr-12 Apr-11		
Power meter EPM-442A Power sensor HP 8481A Poforence 20 dB Attenuator Type-N mismatch combination Reterence Probe ES3DV3 DAE4 Secondary Standards	GB37480704 US37292783 SN: 5086 (20g) SN: 5087 2 / 06327 SN: 3205 SN: 601	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10)	Oct-11 Oct-11 Apr-12 Apr-12 Apr-11 Jun-11		
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Fype-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	GB37480704 U\$37292783 SN: 5086 (20g) SN: 5087.2 / 06327 SN: 3205 SN: 601 ID #	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house)	Oct-11 Oct-11 Apr-12 Apr-12 Apr-11 Jun-11 Scheduled Cheek		
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 10-Oct-02 (in house check Oct-09)	Oct-11 Oct-11 Apr-12 Apr-12 Apr-11 Jun-11 Scheduled Check in house check: Oct-11		
Primary Standards Power meter EPM-442A Power sensor HP 8481A Pelerence 20 dB Attenuator Type-N mismatch combination Reterence Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 UD # MY41092317 100035	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01367) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 16-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09)	Od-11 Oct-11 Apr-12 Apr-12 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11 In house check: Oct-11		
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reterence Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 601 ID # MY41092517 100055 US37390585 S4206	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-10 (No. 253-3206_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 10-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 16-Oct-01 (in house check Oct-09)	Od-11 Oct-11 Apr-12 Apr-12 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11 In house check: Oct-11		
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 6461A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 601 ID # MY/41092517 100055 US37390585 S4206 Name	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 29-Mar-11 (No. 217-01266) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 30-Apr-10 (No. 253-3206_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house) 16-Oct-02 (in house check Oct-09) 16-Oct-02 (in house check Oct-09) 16-Oct-01 (in house check Oct-09) 16-Oct-01 (in house check Oct-10) Function	Od:-11 Od:-11 Apr-12 Apr-12 Apr-12 Jun-11 Jun-11 Scheduled Check in house check: Od:-11 In house check: Od:-11 In house check: Od:-11		

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 85(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
				1

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



- C D Z
- S Schweizerlacher Kellbrierdienst Service suisse d'étaionnage
- C Servizio svizzero di tarstura
- 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 Multileteral Agraement for the recognition of calibration certificates

Glossary:

www.	
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: D1900V2-5d075_Apr11

Page 2 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 87(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 88(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz ∞ 5 mm	
Frequency	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 mha/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.41 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 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	normalized to 1W	40.4 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Hesd 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	normalized to 1W	21.0 mW /g ± 16.5 % (k=2)

Certificate No: D1900V2-5d075_Apr11

Page 3 of 6

Testing Service	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 89(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5 Ω + 6.1 jΩ
Return Loss	- 23.3 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 leadpoint 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

Manu	factured by	SPEAG
Manu	factured on	January 24, 2006

Certificate No: D1900V2-5d075_Apr11

Page 4 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 91(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



DASY5 Validation Report for Head TSL

Date/Time: 05.04.2011 12:41:39

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d075

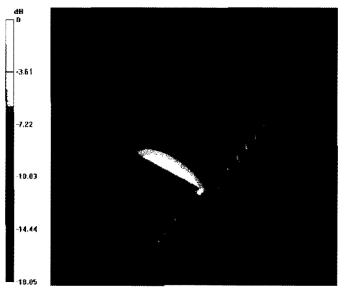
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1900 MHz; $\sigma = 1.41$ mho/m; $\varepsilon_c = 39$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANS1C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mzehanical Surface Detection)
- Electronics; DAE4 Sn601; Calibrated: 10.06,2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement 5W: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Head / d=10mm, Pin=250 mW / Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 97.376 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 18.796 W/kg SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.29 mW/g Maximum value of SAR (measured) = 12.476 mW/g



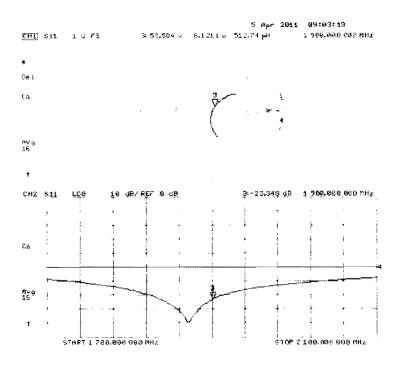
0 dB = 12.480 mW/g

Certificate No: D1900V2-5d075_Apr11

Page 5 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 93(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d075_Apr11

Page 6 of 6

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 94(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Dates of Test		Test Report No F	ICC ID: IC	ID
Becker Aug 21 - Jan. 07-	- Nov 23, 2012 11, 2013	RTS-6012-1211-32 Rev 3 I	L6ARFA90LW 2	503A-RFA90
Calibration Laborator	y of	SWISS S	Schweizerischer Kalibrierdie	enst
Schmid & Partner			Service suisse d'étalonnage	
Engineering AG Zeughausstrasse 43, 8004 Zuric	h, Switzerland	KIBRATE S	Servizio svizzero di taratura Swiss Calibration Service	
Accredited by the Swiss Accredita			No.: SCS 108	
The Swiss Accreditation Service Multilateral Agreement for the n	-			
Client RTS (RIM Test	ing Services)	Certificate No:	D2450V2-747_Nov1	
CALIBRATION C	ERTIFICATI			
Object	D2450V2 - SN: 7	47		
Calibration procedure(s)	QA CAL-05.v8			
	Calibration proce	dure for dipole validation kits above	ve 700 MHz	
	1. 18 1.	1212 868		
	The Halling of Tolegary (100	maket for a release to the second	and a state of the second second	
	And a second share a second second second	IN A DESIGNATION AND A DESIGNATION OF A	 States - States - States 	
Calibration date: This calibration certificate docum		111 ional standards, which realize the physical unit:		
This calibration certificate docum The measurements and the unce	ents the traceability to nat ritainlies with confidence p		s of measurements (SI). are part of the certificate.	
This calibration certificate docum The measurements and the unce	ents the traceability to nat ritainties with confidence p cted in the closed laborato	ional standards, which realize the physical units robability are given on the following pages and	s of measurements (SI). are part of the certificate.	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards	ents the traceability to nat stainties with confidence p cted in the closed laborato TE critical for calibration)	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.)	s of measurements (SI). I are part of the certificate. and humidity < 70%. Scheduled Calibration	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A	ents the traceability to nat intainties with confidence p cted in the closed laborato TE critical for calibration)	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	s of measurements (SI). I are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 6481A	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A	ents the traceability to nat intainties with confidence p cted in the closed laborato TE critical for calibration)	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	s of measurements (SI). I are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 6481A Reference 20 dB Attenuator	ents the traceability to nat artainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	ents the traceability to nat entainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Apr-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 6481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	Interface the traceability to nate the traceab	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11)	s of measurements (SI). I are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 6481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ents the traceability to nat rtainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	ents the traceability to nat rtainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 601	ional standards, which realize the physical units robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 23-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13	
This calibration certificate docum The measurements and the unce All calibrations have been condu Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ents the traceability to nat ritainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005	ional standards, which realize the physical unit robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	s of measurements (SI). are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13	
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 6481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 6481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ents the traceability to nat intainties with confidence p cted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	ional standards, which realize the physical unit robability are given on the following pages and ry facility: environment temperature (22 ± 3)°C Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01351) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	s of measurements (SI). I are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13	



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

T	Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
	Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS) The Swise Accreditation Service is one of the signatories is

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

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

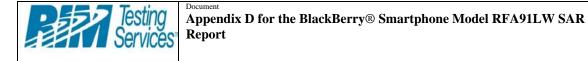
Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- · SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D2450V2-747_Nov11

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

Testing Service			Page 97(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
		RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

Page

98(114)

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	37.7 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	54.1 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.39 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	25.3 mW /g ± 16.5 % (k=2)

Certificate No: D2450V2-747_Nov11

Page 3 of 6



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω + 1.3 jΩ
Return Loss	- 31.2 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

Page 4 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



DASY5 Validation Report for Head TSL

Date: 09.11.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

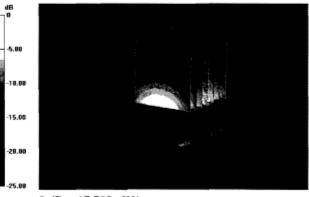
Communication System: CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz; σ = 1.84 mho/m; ϵ_r = 37.7; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 102.1 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 28.853 W/kg SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.39 mW/g Maximum value of SAR (measured) = 17.782 mW/g



0 dB = 17.780mW/g

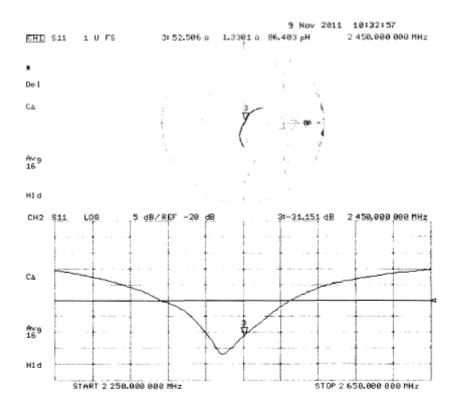
Certificate No: D2450V2-747_Nov	11
---------------------------------	----

Page 5 of 6

Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Testin Servic	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report Report			Page 103(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-747_Nov11

Page 6 of 6

Testing Service	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 104(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Becker Aug 21 - Jan. 07-3	- Nov 23, 2012 11, 2013	1	IC ID: L6ARFA90LW 2503A-RF
Calibration Laborator	y of		Schweizerischer Kalibrierdienst
Schmid & Partner	•		Service suisse d'étalonnage
Engineering AG Zeughausstrasse 43, 8004 Zurici	h, Switzerland	THERE S	Servizio svizzero di taratura Swiss Calibration Service
Accredited by the Swiss Accredita			No.: SCS 108
The Swiss Accreditation Service Multilateral Agreement for the re	-		
Client RTS (RIM Testi	ing Services)	Certificate No	. D5GHzV2-1033_Nov11
CALIBRATION C	ERTIFICAT		
Object	D5GHzV2 - SN:	1033	complete the contract of the c
Calibration procedure(s)	QA CAL-22.v1		
	The life was higher in the same	edure for dipole validation kits bet	ween 3-6 GHz
	Salaten ander salat	edure för dipole validation kits bet	
	**************************************	a Dellace - Children - Chair Adaption	 A statistic density
Calibration date:		011 State	
This calibration certificate docum The measurements and the unce	ents the traceability to na rtainties with confidence	011 tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)*	its of measurements (SI). d are part of the certificate.
This calibration certificate docum The measurements and the unce	ents the traceability to na rtainties with confidence p sted in the closed laborate	tional standards, which realize the physical un probability are given on the following pages ar	its of measurements (SI). d are part of the certificate.
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&1 Primary Standards	ents the traceability to na rtainties with confidence ted in the closed laborato TE critical for calibration)	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.)	its of measurements (SI). d are part of the certificate. C and humidity < 70%. Scheduled Calibration
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&1 Primary Standards Power meter EPM-442A	ents the traceability to na rtainties with confidence p ted in the closed laborato TE critical for calibration) ID # GB37480704	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 6481A	ents the traceability to na rtainties with confidence (ted in the closed laborato TE critical for calibration) ID # GB37480704 US37292783	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A	ents the traceability to na rtainties with confidence p ted in the closed laborato TE critical for calibration) ID # GB37480704	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	ents the traceability to na rtainties with confidence (cted in the closed laborato FE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ents the traceability to na rtainties with confidence (cted in the closed laborato FE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3) ^{ory} <u>Cal Date (Certificate No.)</u> 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	ents the traceability to nai intainties with confidence cited in the closed laborato IE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID #	tional standards, which realize the physical un probability are given on the following pages an ony facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	its of measurements (SI). id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Jul-12 Scheduled Check
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A	ents the traceability to nai intainties with confidence (cted in the closed laborator) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID # MY41092317	tional standards, which realize the physical un probability are given on the following pages an ony facility: environment temperature (22 ± 3)% <u>Cal Date (Certificate No.)</u> 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11)	its of measurements (SI). id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	ents the traceability to nai intainties with confidence cited in the closed laborato IE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID #	tional standards, which realize the physical un probability are given on the following pages an ony facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	its of measurements (SI). id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Jul-12 Scheduled Check
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ents the traceability to nai intainties with confidence (cted in the closed laborator) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID # MY41092317 100005	tional standards, which realize the physical un probability are given on the following pages an ony facility: environment temperature (22 ± 3)% <u>Cal Date (Certificate No.)</u> 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) <u>Check Date (in house)</u> 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	its of measurements (SI). id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
This calibration certificate docum The measurements and the unce All calibrations have been conduc Calibration Equipment used (M&T Primary Standards Power meter EPM-442A Power sensor HP B481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP B481A RF generator R&S SMT-06	ents the traceability to naintainties with confidence provided in the closed laborate of the critical for calibration) ID # GB37480704 US37292783 SN: 5087.2 / 06327 SN: 5047.2 / 06327 SN: 601 ID # MY41092317 100005 US37390585 S4206	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)% Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	its of measurements (SI). Id are part of the certificate. C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-12

 Certificate No: D5GHzV2-1033_Nov11
 Page 1 of 8

 This report shall NOT be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited



Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report

Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

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

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

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. 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: D5GHzV2-1033_Nov11

Page 2 of 8

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited



Document Page Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Page Report 107(114)

Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

Measurement Conditions

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
	5200 MHz ± 1 MHz	
Frequency	5500 MHz ± 1 MHz	
	5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.6 ± 6 %	4.46 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.16 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	80.8 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.33 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.0 mW /g ± 16.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.2 ± 6 %	4.75 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition		
SAR measured	100 mW input power	8.82 mW / g	
SAR for nominal Head TSL parameters	normalized to 1W	87.3 mW / g ± 17.0 % (k=2)	
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition		
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.50 mW / g	

Certificate No: D5GHzV2-1033_Nov11



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2013			

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.7 ± 6 %	5.03 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.03 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	79.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	22.5 mW / g ± 16.5 % (k=2)

Certificate No: D5GHzV2-1033_Nov11

Page 4 of 8

Testing Service	Document Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report		Page 109(114)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW
	Jan. 07-11, 2015			

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	51.1 Ω - 8.7 jΩ
Return Loss	- 21.2 dB

Antenna Parameters with Head TSL at 5500 MHz

Im	pedance, transformed to feed point	52.3 Ω - 2.7 jΩ
Re	etum Loss	- 29.2 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	56.7 Ω - 4.3 jΩ
Return Loss	- 22.6 dB

General Antenna Parameters and Design

	Electrical Delay (one direction)	1.202 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	July 09, 2004

Page 5 of 8



DASY5 Validation Report for Head TSL

Date: 15.11.201

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1033

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz Medium parameters used: f = 5200 MHz; σ = 4.46 mho/m; ε_r = 34.6; ρ = 1000 kg/m³, Medium parameters used: f = 5500 MHz; σ = 4.75 mho/m; ε_r = 34.2; ρ = 1000 kg/m³, Medium parameters used: f = 5800 MHz; σ = 5.03 mho/m; ε_r = 33.7; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.41, 5.41, 5.41), ConvF(4.91, 4.91, 4.91), ConvF(4.81, 4.81, 4.81); Calibrated: 04.03.2011
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- · Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 65.595 V/m; Power Drift = 0.07 dB Peak SAR (extrapolated) = 30.134 W/kg SAR(1 g) = 8.16 mW/g; SAR(10 g) = 2.33 mW/g Maximum value of SAR (measured) = 18.725 mW/g

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 66.819 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 35.056 W/kg SAR(1 g) = 8.82 mW/g; SAR(10 g) = 2.5 mW/g Maximum value of SAR (measured) = 21.019 mW/g

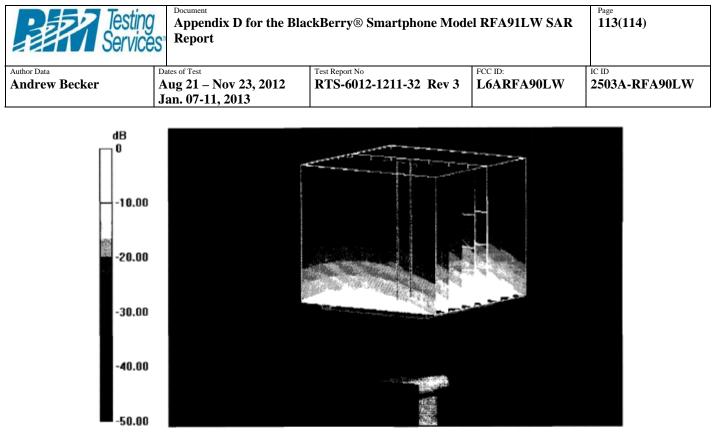
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 62.220 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 33.743 W/kg SAR(1 g) = 8.03 mW/g; SAR(10 g) = 2.28 mW/g Maximum value of SAR (measured) = 19.463 mW/g

Certificate No: D5GHzV2-1033_Nov11

Page 6 of 8

This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited

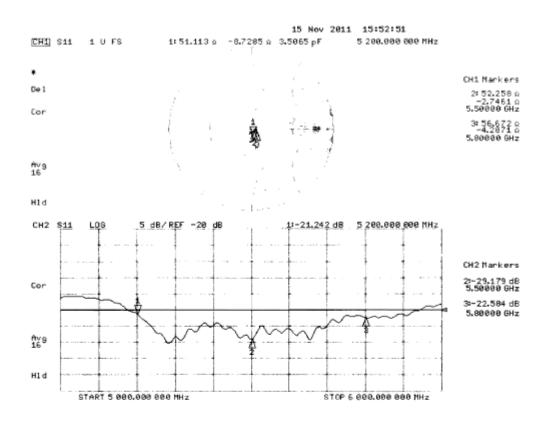
Testing Service	Appendix D for the Bla Report	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW



⁰ dB = 19.460mW/g

Testin Servic	Appendix D for the BlackBerry® Smartphone Model RFA91LW SAR Report			Page 114(114)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	Aug 21 – Nov 23, 2012 Jan. 07-11, 2013	RTS-6012-1211-32 Rev 3	L6ARFA90LW	2503A-RFA90LW

Impedance Measurement Plot for Head TSL



__Certificate No: D5GHzV2-1033_Nov11 Page 8 of 8 This report shall <u>NOT</u> be reproduced except in full without the written consent of RIM Testing Services Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited