Testing Service	Appendix D for the BlackBe Report	erry® Smartphone Mo	del RFL111LW SAR	Page 1(119)
Author Data	Dates of Test	Test Report No	FCC ID:	IC
Andrew Becker	Nov 22 2012 – Feb 28 2013	RTS-6026-1302-13	L6ARFL110LW	2503A-RFL110LW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA



Document

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **2(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeoghavastrasse 40, 8004 Zurich, Switzerland





S Schweizerincher Kalibriendenst G Senrice suisse d'ittalonnage Senricio svissero di teratura Swiss Calibration Service

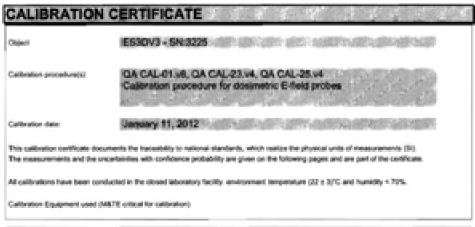
According by the Swiss Accordination Service (SAS)
The Swiss Accordination Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Pilland

RTS (RIM Testing Services)

Curettum No: ES3-3225_Jan12

Accreditation No.: SCS 108



Primary Standards	6	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	G8412908P4	30-Mar-11 (No. 217-01072)	Apr-12
Power sensor E4412A	MY45498087	31-Mar-11 (No. 217-01372)	App-12
Reference 3 dB Abenuator	5N: 55054 (No	29-Mar-11 (No. 217-01369)	App-52
Reference 20:48 Attenuator	SN: 55096 (20to)	29-Mar-11 (No. 217-01367)	Age-12
Reference 30-dB Attenuator	SN: 88129 (30b)	29-Mar 11 (No. 217-01370)	Age-10
Reference Probe ESI3CV2	SN: 3013	29-Dec-11 (No. ES3-3013, Dec11)	Dec-12
DASK	SN: 654	3-May-11 (No. DAE4-654, May11)	May-12
Secondary Standards	ю	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US064QU01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8750E	US37590585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Julion Kashrell	Leboratory Factorigian	The
aproved by	Call Patrick	Technood Manager	selly.
			Issued January 12, 2012

Certificate No: ES3-3225_Jan12

Page 1 of 11



Document

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page 3(110

3(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

Ċ

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstresse 43, 8004 Zurich, Switzerlan





Schweizertscher Kalibrierdienst Service solese d'étalonnage Servicio solzzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swice Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signaturies to the EA Multipleral Agreement for the recognition of calibration certificates

Glossary:

TSL fissue simulating liquid NORMx.y.z sensitivity in the space convil 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 o rotation around probe axis

Polarization 9 9 rotation around an axis that is in the plane normal to probe axis (at measurement center).

i.e., 9 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1526-2003. TEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques*, December 2003
- IEC 62299-1, "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 3 = 0 (f s 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
 NORMx,y,z are only informediate 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 suffware versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of CoruF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with OW 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.
- ConsF and Boundary Effect Planameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f x 850 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 " ConsF whereby the uncertainty corresponds to that given for ConsF. A frequency dependent. ConsF is used in DASY version 4.4 and higher which allows extending the validity from z 50 MHz to z 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch anienna.
- Sensor Offset. The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Copyright 2005-2013, RIM Testing Services, a division of Research In Motion Limited



ES30V3 - SN:3225

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



5(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

ES30Y3- 5N:3225

January 11, 2012

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Uno (km2)
Norm (µV/(V/m) ²) ^A	1.26	1.20	1.30	+ 10.1%
DCP (mV)*	101.2	100.8	101.2	

Modulation Calibration Parameters

UID	Communication System Name	PAR		40	-60	69	VR mV	Unc* (k=2)
10000	CW	0.00	Ж	0.00	0.00	1.00	107.7	11.7 %
			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%.

Certificate No. ES3-3225_Jan/12

Page 4 of 11

The uncertainties of NormiX,Y,Z do not affect the E⁴-field uncertainty inside TSL (see Pages 5 and 6).

^{*} Numerical Inscarcation parameter: uncortainty not required.

** Uncortainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



Page 6(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

ES30V3- SN:3225

January 11, 2012;

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

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^d	Relative Permittivity*	Conductivity (Sim)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unot. (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	1 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	1120%
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 %

Certificate No: ES3-3225_Jan/12

⁶ Prequency validity of a 100 MHz only applies for DASY v4.4 and higher (see Page 2), size it is restricted to a 50 MHz. The uncertainty is the RSS of the Count uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
⁷ At frequencies below 3 GHz, the validity of feave parameters (s. and c) can be retired to a 10% if liquid compressation formula is applied to measured SAM values. At frequencies above 3 GHz, the validity of feave parameters (s. and c) is restricted to a 5%. The uncertainty is the RSS of the Count uncertainty for indicated target feave parameters.



7(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

ES30V3- SN:3225

January 11, 2012

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

Calibration Parameter Determined in Body Tissue Simulating Media

г(мн _о)*	Relative Permittivity*	Conductivity (5/m)	ComrF 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	1 12.0 %
2600	52.5	2.16	4.12	4.12	4.12	0.80	0.99	1 12.0 %

Certificate No: ES3-3225_Jan12

Page 6-of 11

¹ Preguency validity of a 100 MHz only applies for DADY v4.4 and higher (see Page 2), else it is neethined to a 50 MHz. The uncertainty is the RSS of the Convil² uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
² At frequencies below 3 GHz. the validity of feace parameters (s and c) can be refused to a 10% if liquid compensation formula is applied to measured SARV extress. At frequencies above 3 GHz, the validity of feace parameters (s and v) is nestricted to a 5%. The uncertainty is the RSS of the Convil² uncertainty for indicated target feace parameters.



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **8(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID: L6ARFL110LW

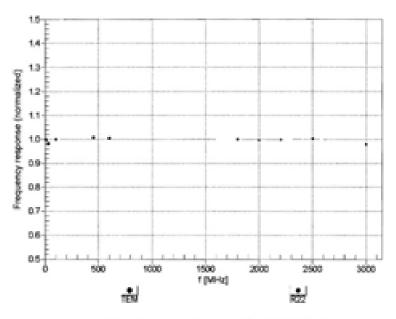
2503A-RFL110LW

ES30V9- SN:3225

January 11, 2012:

Frequency Response of E-Field

(TEM-Cell:ff110 EXX, Waveguide: R22)



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

Certificate No: E53-3225_Jan/12

Page 7 of 11

Testing Services	
---------------------	--

Page **9(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

L6ARFL110LW

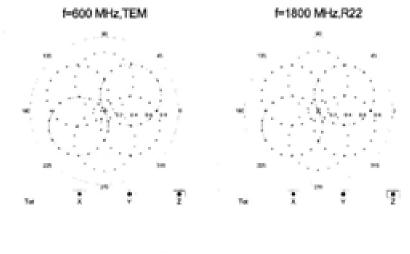
FCC ID:

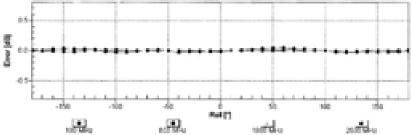
2503A-RFL110LW

ES30V3-- SN:3225

January 11, 2012

Receiving Pattern (\$\phi\$), 9 = 0°





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

Certificate No. ES3-3225_Jan/12

Page 6 of 11



10(119)

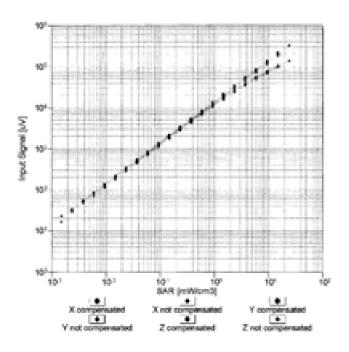
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

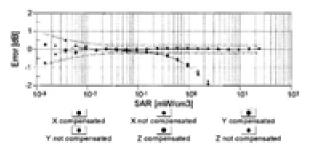
2503A-RFL110LW

E\$30Y3-5N3225

January 11, 2012

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





Certificate No: ES3-3225_Jav12

Page 9 of 11



Page **11(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

L6ARFL110LW

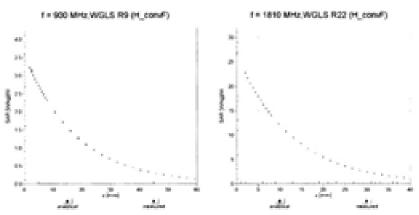
January 11, 2012

FCC ID:

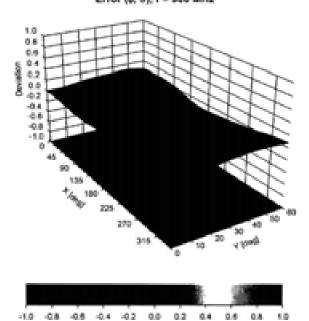
2503A-RFL110LW

ES30V3-- SN:3225

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (6, 9), f = 900 MHz



Certificate No: ES3-3225_Jan/12

Page 10 of 11

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



12(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID:

L6ARFL110LW

2503A-RFL110LW

ES30V3- SN 3225

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



13(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID:

8

O.

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse Cl. 8004 Zurich, Switzerla





Schweizerlocher Kalibrierdienst Service suisse d'étalonnage Servicio sviszero di terotore Steins Calibration Service

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

RTS (RIM Testing Services)

Calibration Equipment used (M&TE critical for calibration)

Accorditation No.: SCS 108 Contribute No: ES3-3225_Jan 13

CALIBRATION CERTIFICATE ES3DV3 - SN:3225 Object Calibration procedure(s) QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes January 10, 2013 Calibration date: This calibration confiduate documents the traceability to national standards, which realize the physical units of measurements (\$10). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the confidents. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 x 3)°C and humidity < 70%.

Primary Standards	0	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E44196	G841250874	29-May 12 (No. 217 01608)	Apr-13
Power sensor E441QA	M7Y41498987	29-May-12 (No. 217-01508)	Apr-13
Reference 3 dfl Attenuator	5N: 55054 (N)	27 Mar 12 (No. 217 01501)	Apr-13
Reference 20 dB Attenuator	SN: 55085 (20b)	27 Mar-12 (No. 217-01929)	Apr.13
Reference 30 dB Attenuator	SN: 55429 (30b)	27-May-12 (No. 217-01652)	Apr-13
Reference Probe ES30V2	SN: 3013	26-Dec-12 (No. ESS-3013, Dec12)	Dec-13
DAE4	SIN: 660	20 Jun 12 (No. DAD4-660, Jun 12)	Jun 13
Secondary Standards	D	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 87508	US37390585	18-Oct-01 (in house sheck Oct-12)	In house check: Oxt-13

	Name	Function	Signature
Cellbraried by:	Jeton Kastrali	Laboratory Technician	fu
Approved by:	Karja Pokovic	Technical Manager	De dy
			tenued: January 14, 2013

Certificate Nor US3-3225, Jan 13

Page 1 of 11



14(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

8

2503A-RFL110LW

Calibration Laboratory of

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





Schweizerischer Kalibrierdienst 8 Service suisse d'étalonnage C

Servicio sviszero di taratura Swiss Calibration Service

Acceptitation 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 cartificates

Glossary:

TSI. NORMx,y,z Const

tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx,y,z diade compression point

DCP CF. A. B. C. D

crest factor (1/duty, cycle) of the RF signal modulation dependent linearization parameters

Polarization e

e rotation around probe axis

Polarization 3:

3 rotation around an axis that is in the plane normal to probe axis (at measurement center).

i.e., 3 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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:

- NORMs, y.z: Assessed for E-field polarization 5 = 0 (f c 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMs, y, z are only intermediate values, i.e., the uncertainties of NORMs, 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: Dx,y,z: VRx,y,z: A, B, C, D 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.
- Coowf 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 a 50 MHz to a 100 Militar.
- 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 to (on probe axis). No tolerance required.

Certificate No: E53-3225 Jan 53

Page 2 of 11



15(119)

Andrew Becker

Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

ES30V3 - SN3225

January 10, 2013

Probe ES3DV3

SN:3225

Manufactured: Calibrated:

September 1, 2009 January 10, 2013

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

Certificate No: ES3-3225_Jan13

Page 3 of 11



16(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 - Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

ES30V3-- SN:3225

January 10, 2013

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Ume (kr42)
Monm (µVI(Vilm) ²) ⁴	1.29	1.19	1.31	a 10.1 %
DCP (mV)"	100.5	101.5	99.9	

Modulation Calibration Parameters

UID	Communication System Name		dB	B dB√yV	-0	0 dB	VR mV	Une* (k=2)
Ġ.	CW	X	0.0	0.0	1.0	0.00	157.5	12.7 %
		Y	0.0	0.0	1.0		158.4	
		Z	0.0	0.0	1.0		165.9	

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%.

Certificate No: ES3-3225, Jan13

Page 4 of 11

The uncertainties of NormX,Y,Z do not affect the E^{ℓ} field uncertainty inside TSI, (see Pages 5 and 6).

Numerical inconnection parameter: uncertainty not required.

Uncorrowny is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the Sold value.



17(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

6530V3- SN:3225

January 10, 2013

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

Calibration Parameter Determined in Head Tissue Simulating Media

r (MHz) ^c	Relative Permittivity	Conductivity (Sim)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.56	6.56	6.56	0.42	1.54	± 12.0 %
900	41.5	0.97	6.19	6.19	6.19	0.43	1.52	± 12.0 %
1810	40.0	1.40	5.35	5.35	5.35	0.63	1.39	± 12.0 %
1950	40.0	1.40	5.09	5.09	5.09	0.80	1.23	1 12.0 %
2450	39.2	1.80	4.65	4.65	4.65	0.61	1.63	± 12.0 %
2600	39.0	1.96	4.43	4.43	4.43	0.80	1.32	± 12.0 %

Cortificate No: ES3-3225 Jan 13

⁶ Prequency validity of a 100 MHz only applies for DASY vt.4 and higher (see Page 2), else it is nestricted to a 50 MHz. The uncertainty is the RSS of the Comiff uncertainty at califoration frequency and the uncertainty for the indicated frequency band.
⁷ At Requestions better 3 GHz, the validity of issue parameters (a and 4) can be released to a 10% if liquid compensation formula is applied to measured SAR values. At the questions above 3 GHz, the validity of issue parameters (a and 4) is restricted to a 5%. The uncertainty is the RSS of the Comiff unpertainty for indicated target issue parameters.



18(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 - Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

ES30V3- SN:3225

January 10, 2013

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

Calibration Parameter Determined in Body Tissue Simulating Media

r (MHa) °	Relative Permittivity	Conductivity (Sim)	Convil X	ConvF Y	ConvF Z	Alpha	Ovepth (mm)	Unct. (N/2)
750	55.5	0.96	6.27	6.27	6.27	0.48	1.51	± 12.0 %
900	55.0	1.05	6.12	6.12	6.12	0.73	1.25	1 12.0 %
1810	53.3	1.52	5.04	5.04	5.04	0.57	1.47	112.0%
1950	53.3	1.52	4.94	4.94	4.94	0.58	1.50	± 12.0 %
2450	52.7	1.95	4.35	4.35	4.35	0.70	1.16	± 12.0 %
2600	52.5	2.16	4.11	4.11	4.11	0.67	0.99	± 12.0 %

Certificate No: ES3-3225 Jan13

Page 6 of 11

⁶ Frequency validity of a 100 MHz only agains for DASY vt.4 and higher (see Page 2), else it is restricted to a 50 MHz. The uncertainty is the RSS of the ConvF uncertainty is galibration frequency and the uncertainty for the indicated frequency band.
⁸ All frequencies before 3-OHz, the validity of lissue parameters (x and x) can be reliated to a 50% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of lissue parameters (x and x) is restricted to a 5%. The uncertainty is the RSS of the ConvF uncertainty for redicated target tissue parameters.



Document

Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

19(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

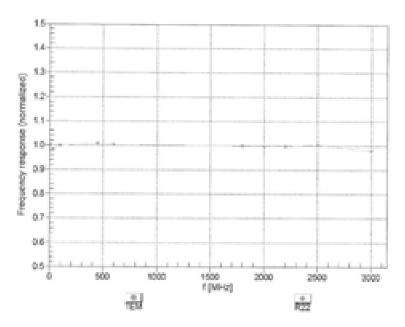
2503A-RFL110LW

E530V3- SW 3225

January 10, 2013

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

Conficate No: ES3-3225 Jun 13

Page 7 of 11



Author Data

Andrew Becker

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR

Report

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

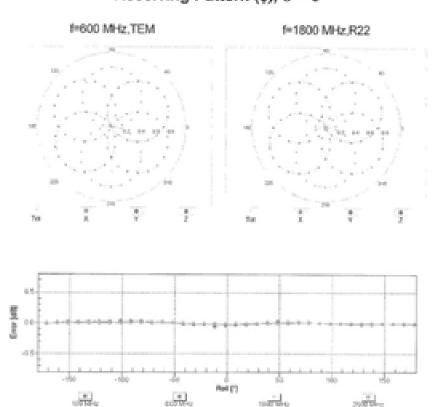
2503A-RFL110LW

20(119)

E530V3-5N:3225

January 10, 2013

Receiving Pattern (6), 9 = 0°



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

Certificate No: ES3-3225_Jan13

Page 8 of 11



21(119)

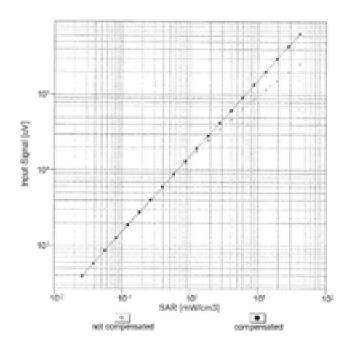
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

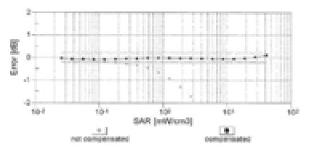
2503A-RFL110LW

ES30V3- SN:3025

January 10, 2013

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





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

Certificate No: ES3-3225_Jan/13

Page 9 of 11



Page **22(119)**

Author Data
Andrew Becker

Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No **RTS-6026-1302-13**

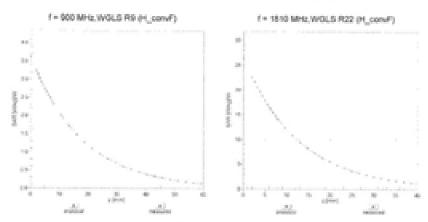
FCC ID: L6ARFL110LW

2503A-RFL110LW

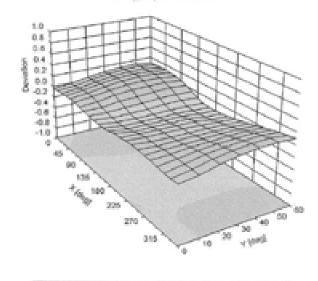
ESSIDVS- SNI3225

January 10, 2013

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (4, 9), f = 900 MHz



-1.0 -0.8 -0.5 -0.4 -0.2 0.0 0.2 0.4 0.5 0.8 1.1 Uncertainty of Spherical Isotropy Assessment: 2.2.6% (k=2)

Certificate No: ES3-3225_Jan13

Page 10 of 11



Document

Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **23(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

ES30V3-- SN 3225

January 10, 2013

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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	8.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Överall 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_Jan/13

Page 11 of 11



24(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID:

L6ARFL110LW

2503A-RFL110LW

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





Service suisse d'étalonnage Servizio svigaero di taratura Swiss Calibration Service

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No. EX3-3592_Nov12

CALIBRATION	CERTIFICATE
Object.	EX3DV4 - SN:3892
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:	November 14, 2012
	uments the traculability to national econdards, which realize the physical units of measurements (\$10), containdes with confidence probability are given on the following pages and are part of the outstooks.
All ceribrations have been con	ducted in the closed laboratory facility, environment temperature (32 s. 3)°C and humbley < 70%.
Calibration Equipment used (1	MBTE orition for uniforation)

Primary Standards	0	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E44190	0841290874	29-Mar-12 (No. 217-01908)	Apr-13
Power sensor E-H 12A	MOTOR I HISBOOK?	29-Mar-12 (No. 217-01508)	Apr-15
Reference 3 dli Attenuator	SN: 55054 (3c)	27-May-12 (No. 217-01531)	Apr-15
Reference 20 dB Attenuator	5N: 55086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	591 55129 (30b)	27-Mar-12 (No. 217-01630)	Apr-13
Reference Probe ESCRY2	SNC 3013	29-Dec-11 (No. ESS-3013_Dec11)	Dec-12
DAE4	SN: 550	20-Au-12 (No. DAE4480_Jun12)	Jun-13
Secondary Standards	0	Check Date (in house)	Scheduled Check
RF generator HP 8645C	US3642U61750	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Noteo's Analyzer HP 67535	US37360565	16-Oct-01 (in house check Oct-52)	In house check: Oct-13

Culibrated by:	Name Claudo Leubler	Function Laboratory Tachnician	Grape Gr
Approved by:	Kalja Pokovic	Technical Manager	De My
This entitlement cartification	a sheet not become returned expect in fall	without written promoted of the Substitute	Issued November 14, 2012

Certificate No. EX3-3592_Nov12

Page 1 of 11



Documen

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

25(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG Zeughaustrasse 43, 8694 Zerich, Switzerland





S Schweigerischer Kallbrierdenst G Service suisse d'étalonnage S Servicie svicsers di tarature Swiss Calibration Service

Accreditation No.: SCS 188

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 NORMx,y,z ConvF tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx.y.z diode compression point

DCP diode compression point

OF crest factor (1/duty_cycle) of the RF signal

A, B, C modulation dependent linearization parameters

Polarization o o rotation around probe axis

Polarization 3

3 rotation around an axis that is in the plane normal to probe axis (at measurement center).

i.e., 3 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

- EEE Std 1528-2003, "EEE Recommended Practice for Determining the Peak Spalial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- EC 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:

- MORMs.y.z: Assessed for E-field polarization 5 = 0 (f < 900 MHz in TEM-celt f > 1800 MHz: R22 waveguide).
 NORMs.y.z are only intermediate values, i.e., the uncertainties of NORMs.y.z does not affect the E²-field uncertainty inside TSL (see below Cors/F).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chert). 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.
- DCP_{x,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 undertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORBE, 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 z 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: EX3-3592_Nov12

Page 2-of 11



26(119)

Andrew Becker

Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

EXXDV4 - SN:2592

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: EX3-3992_Nov12

Page 3-of 11



27(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 - Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

EXCEPT4- \$50,3692

November 14, 2012

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

Basic Calibration Parameters

	Sensor X	Serveor Y	Sensor Z	Unio (%=2)
Norm (µW[Vinsj ²] ^A	0.49	0.47	0.41	2 10.1 %
DCP (WV) ^P	95.2	96.1	100.6	

Modulation Calibration Parameters

UID	Communication System Name	PAR	П	A dB	8 (8)	C dB	VR mV	Umg ¹ (k=2)
0	CW	0.00	X	0.0	0.0	1.0	121.4	13.0 %
			Y	0.0	0.0	1.0	104.3	
			2	0.0	0.0	1.0	109.2	The second

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 6. Asid uncertainty inside TSL (see Pages 5 and 6).

* Numerical financiation parameter: uncertainty not required.

* Uncertainty is determined using the max, deviation from linear response applying rectangular detribution and is expressed for the square of the field value.



28(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

EXCEPTA- SNUMBER

November 14, 2012

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

Calibration Parameter Determined in Head Tissue Simulating Media

r (MHu) ⁴	Relative Permittivity	Conductivity (Sim)	ConvF X	ConvF Y	ConvF Z	Alpha	Grepth (mm):	Unot. (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	1 13.1 %
5500	35.6	4.96	4.28	4.28	4.28	0.44	1.80	113.15
5800	35.3	5.27	4.12	4.12	4.12	0.48	1.80	113.13

Gertificate No: EX3-3592_Nov12

Page 5-of 11

⁶ Proquency validity of a 100 filtrs any applies for DASY v4.4 and higher (see Page 2), also 8 is restricted to a 50 MHz. The uncertainty is the RSS of the Curve* uncertainty is collimated heavency band.
⁷ At Requestions below 3 GHz, the validity of fiscus parameters (i), and ii) can be released to a 10% if liquid compression formula is applied to assessment SAR values. At Propositions above 3 GHz, the validity of fiscus parameters (ii) and iii) is restricted to a 2%. The uncortainty is the RSS of the Curve* unsertainty for indicated larget losses parameters.



29(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

EXCEV4- 5N:3592

November 14, 2012

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

Calibration Parameter Determined in Body Tissue Simulating Media

r (MHz) ^c	Relative Permittivity*	Conductivity (5/re)	ConvF.X	CoevF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2800	52.5	2.16	6.59	6.59	6.59	0.80	0.50	1 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 %

Gentificate No: EX3-3592, Nev12 Page 6 of 11

⁶ Frequency variety of a 100 M/ss only applies for DADY of A and higher (see Page 2), also it is restricted to a 55 M/ss. The uncertainty is the RSS of the Comiff uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
At temperature better 3 GHz, the velicity of tissue persentiers (a and in) can be reliased to a 10% if logist compensation formula is applied to resourced SAM values. At frequencies since 3 GHz, the velicity of tissue-parameters (i) and in) is restricted to a 5%. The uncertainty is the RSS of the Comiff uncertainty for indicated target tissue parameters.



Dates of Test Author Data **Andrew Becker** Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

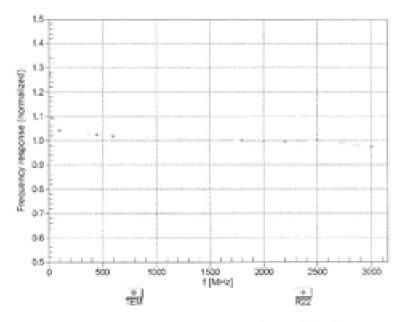
2503A-RFL110LW

30(119)

EX30V4-9N: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



31(119)

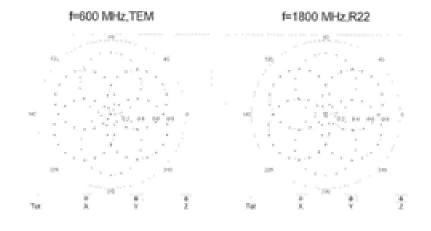
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

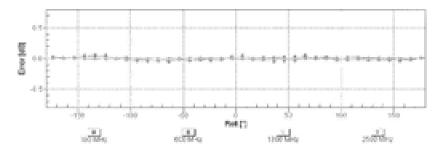
2503A-RFL110LW

EX3DV4- SN 3592

November 14, 2012

Receiving Pattern (\$\phi\$), 9 = 0°





Uncertainty of Axial Isotropy Assessment: ± 9.5% (k=2)

Certificate No. EXX-3592_Nov12

Page 8-of 11



32(119)

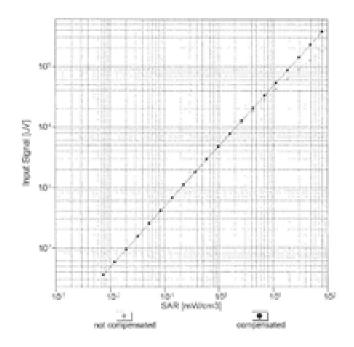
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

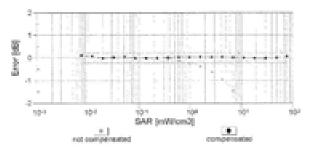
2503A-RFL110LW

EXCOVA- 8N/3682

November 14, 2012

Dynamic Range f(SARhead) (TEM cell , f = 900 MHz)





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

Certificate No: EXXI-3592_Nov12

Page 9 of 11



33(119)

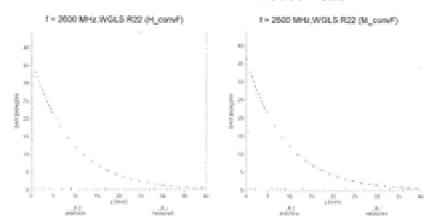
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

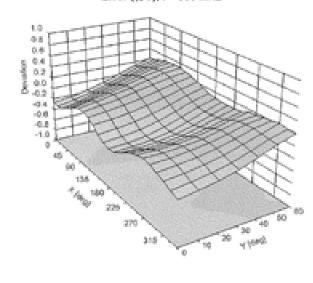
EXCEVE- \$10,0002

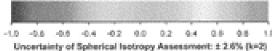
November 14, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (¢, 3), f = 900 MHz





Certificate No: EX3-3512, Nov12

Page 10 of 11



Document

Appendix D for the BlackBerry ${\bf @}$ Smartphone Model RFL111LW SAR Report

34(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

EXCOVA-5N:3692

November 14, 2012

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

Other Probe Parameters

Sensor Amangament	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 mm
Recommended Measurement Distance from Surface	2 mm

Certificate No: EX3-3592_Nor12

Frage 11 of 11.



35(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse KI, 1004 Zurich, Swigerland





Schweigerischer Kalibrierdienst Service suisse d'étalonnage. Servizio svissoro di taratura Swise Calibration Service

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

8

C.

Certificate No. ET3-1644_Nov12

CALIBRATION CERTIFICATE

Object

ET30V6 - SN:1644

Calibration procedure(s)

QA CAL-01.v6, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes

Calibration date:

November 13, 2012

This palibration certificate documents the traceability to restonal standards, which realize the physical units of measurements (SII). The measurements and the unconsisties with confidence probability are given on the following pages and are part of the certificate.

All cultivations have been conducted in the closed laboratory facility: environment temperature (52 s.3)°C and humidity < 70%

Calibration Equipment used (MATE ortical for calibration):

Primary Standards	0	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EAH199	G841299874	29-Mar-12 (No. 217-01506)	Apr 13
Power sensor CAH10A	MY41498087	29-Mar-12 (No. 217-01908)	Agri-13
Rotlerence 3 offt Attenuation	SAC 55054 (3c)	27-Mar 12 (No. 217-01631)	Age 13
Reference 20 dB Attenuator	SAL 55006 (20to)	27-Mar-12 (No. 217-01626)	Apr.13
Eulerence 30 dB Abenuator	574: 65129 (30%)	29-Mar-12 (No. 210-01632)	Apr-13
Pelerence Proto ES30Y2	5%: 30%	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	529:000	20-Jun 12 (No. DAE4400 Jun 12)	Jun-13
Secondary Standards	0	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US\$642U01700	4-Aug-99 on house check-Apr-110	In house check: Apr-13
Nethersk Analysis HP 67530	US37380685	18-Oct-01 (in house check Ost-12)	In house check: Oct-13

Calibrated by:	Name Jeton Kastrali	Function Laboratory Technician	Signature F-VC
Approved by:	Katja Pshovis	Technical Manager	Bely
This calibration conflicate	e shall not be reproduced except in ful	without written approval of the laborato	Issued: November 13, 2012 ry.

Certificate No. ET3-1644_Nov12

Page 1 of 11



36(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG unstranse 43, 6004 Zurich, Switzerland





Echwelenischer Kalibrierdionst 8 Service salese d'étalornage C Servicio svictoro di taratura 8 **Swiss Calibration Service**

Accomplisation No.: SCS 108

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

Glossary:

tissue simulating liquid TSL NORthbuy.z sensitivity in free space Com/F sensitivity in TSL / NORMx.y.z DCP diode compression point

crest factor ('Liduty_cycle') of the RF signal OF. A.B.C modulation dependent linearization parameters

Polarization e o rotation around probe axis

3 rotation around an axis that is in the plane normal to probe axis (at measurement center). Polarization b

i.e., it = 0 is normal to probe axis

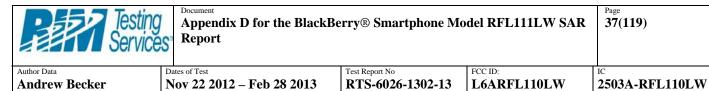
Calibration is Performed According to the Following Standards:

- a) IEEE Std 1526-2003, TEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques', December 2003
- 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 2006

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 8 = 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 Charl). This linearization is replemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPs.v.r. DCP are numerical linearization parameters assessed based on the data of power sweep with CN 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 > 500 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. " CoreF whereby the uncertainty corresponds to that given for CoreF. A frequency dependent Convil is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100
- Spherical isotropy (3D deviation from isotropy): in a field of low-gradients realized using a flat phantom exposed by a patch artenna.
- Sensor Offset. The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Page 2 of 11 Cartificate No. ET3-1644_Nov12



·

ET30V6 - SN:1644

November 13, 2012

Probe ET3DV6

SN:1644

Manufactured: Calibrated: November 7, 2001 November 13, 2012

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

Certificate No: ET3-1944_Nov12

Page 3-of 11



38(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 - Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

ET30V6- SN:1644

November 13, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1644

Basic Calibration Parameters

	Sensor X	Sensor Y	Serveor Z	Unio (km2)
Norm (µW(Vim) ²) ⁴	1.71	1.97	1.98	± 10.1 %
DCP (m/V)*	99.5	98.7	97.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A. dB	46	6B	WR	Unc' (kr2)
0	CW	0.00	×	0.0	0.0	1.0	193.5	13.5 %
	1		Y	0.0	0.0	1.0	212.0	
			2	0.0	0.0	1.0	201.7	

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

[&]quot;The uncontainties of NormX,Y,Z do not affect the 6" field uncontainty inside TSL (toe Pages 5 and 6).
"Numerical brancastion parameter: uncontainty not required.
"Uncontainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the



39(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 - Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

ETSOV6-SN:1644

November 13, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1644

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHHz) ⁶	Relative Permittivity	Complectivity (Sim)	Convf X	ConvF Y	ConvF Z	Alipha	Depth (men)	Unct. (k=2)
750	41.9	0.89	6.67	6.57	6.57	0.44	2.25	1 12.0 %
900	41.5	0.97	6.24	6.24	6.24	0.38	2.52	£ 12.0 %
1810	40.0	1.40	5.21	5.21	5.21	0.80	2.10	± 12.0 %
1950	40.0	1,40	5.16	5.16	5.16	0.80	2.09	± 12.0 %
2450	39.2	1.60	4.60	4.60	4.60	0.65	2:00	a 12.0 %

Certificate No: ET3-1644, Nov12

^{*} Prequency validity of a 100 MHz only applies for DASY vL4 and higher [see Page 25, else it is restricted to a 50 MHz. The uncertainty is the RSS of the Cond* uncertainty of califoration frequency and the uncertainty for the indicated frequency band.
* At frequencies below 3 GHz, the validity of feases promises to lose to indicated to a 10% if liquid componention formula is applied to measured 6AR values. At frequencies above 3 GHz, the validity of fease parameters (it and it) is restricted to a 5%. The uncertainty is the RSS of the Cond* uncertainty for indicated target fease parameters.



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **40(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

ET30V6- SN:1644

November 13, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1644

Calibration Parameter Determined in Body Tissue Simulating Media

r (white) ^o	Relative Permittivity*	Conductivity (S/m)	Convf X	Const Y	ConsF Z	Alipha	Depth (mm)	Unet. (k=2)
750	65.6	0.96	6.30	6.30	6.30	0.33	2.61	± 12.0 %
900	55.0	1.05	6.06	6.06	6.06	0.31	2,99	± 12.0 %
1810	53.3	1.52	4.75	4.75	4.75	0.80	2.40	± 12.0 %
1950	53.3	1.52	4.75	4.75	4.75	0.80	2.28	± 12.0 %
2450	52.7	1.95	4.11	4.11	4.11	0.50	2.16	112.0 %

⁶ Prequency vehicly of it 100 MHz only applies for CMSY vt.4 and higher (see Page 2), also it is restricted to a 50 MHz. The uncertainty is the PSS of the Constitution included because years.
⁷ All helpuncies below 3 GHz, the self-bity of trace parameters (a and 4) can be retired to a 10% if liquid companisation formula is applied to these parameters (a and 4) can be retired to a 10% if liquid companison formula is applied to these parameters (a and 4) is restricted to a 5%. The uncertainty is the RSS-of the Constitution for indicated target trace parameters.

Certificate No. ET3-1644_Nov12

Page 6 of 11



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **41(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

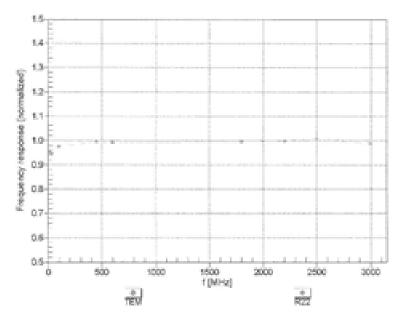
2503A-RFL110LW

ET30Y6- SN:1644

November 13, 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: ET3-1644_Nov12

Page 7 of 11



cument					
nnandiv	n	for	tho	Pla	مlعR

the BlackBerry® Smartphone Model RFL111LW SAR Report

42(119)

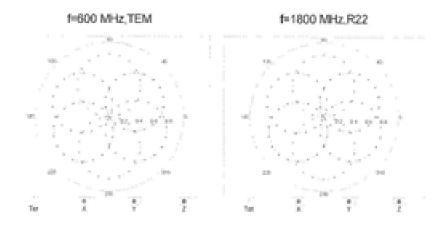
Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

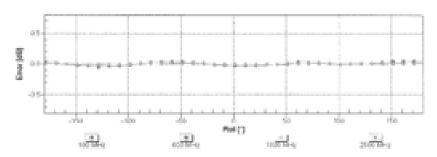
2503A-RFL110LW

ET30V6- SN:1944

November 13, 2012

Receiving Pattern (4), 9 = 0°





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

Certificate No: ET3-1644_No:12

Page 8 of 11.



43(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

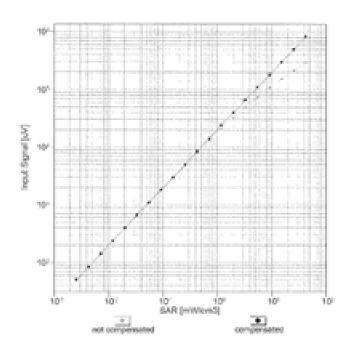
FCC ID:

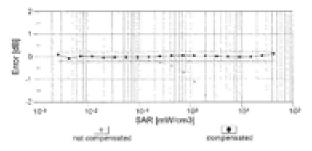
2503A-RFL110LW

ET30V6- SN:1644

November 13, 2012

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





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

Certificate No: ET3-1644_Nov12

Page 9 of 11



Author Data

Andrew Becker

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

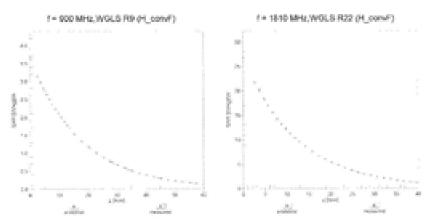
2503A-RFL110LW

44(119)

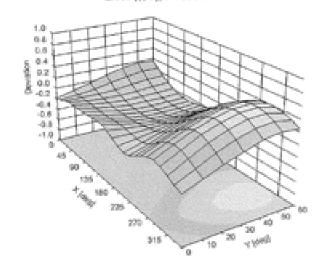
ET30V6- SN:1644

November 13, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (6, 3), f = 900 MHz



0.6 0.2 0.4 0.6 -0.6 -0.4 -0.2 0.0 Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Certificate No: ET3-1644_Nov12

Page 10-st 11



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **45(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

ET30W6- SN:1644

November 13, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1644

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	61.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	enabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Dumeter	(.) mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

Certificate No: ET3-1644_Nov12

Page 13 of 11



46(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

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





Service suisse d'étalonnage Servicio avignero di taratura Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: SCS 108

ALIBRATION C	ERTIFICATE	E.A	SHEP RE
Signet	D750V3 - SN: 10	21	
albration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
albraton date:		Millionia etc.	
he measurements and the unce	idainties with confidence p	ional standards, which realize the physical or robability are given on the following pages a ry facility: environment temperature (22 a 3)	and are part of the certificate.
Yimary Standards	lp.	Cal Date (Certificate No.)	Scheduled Calibration
peer meter EPM-442A	G837480704	06-Oct-10 (No. 217-01266)	Oct-11
ower sensor MP 6461A	U6/372927W0	06-Out-10 (No. 217-01266)	Oct-11
derence 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01156)	Mar-11
spe-Ni mismatch-combination	SN: 5047.2 / 06027	30-Mar-10 (No. 217-01162)	Mar-11
eference Phobe ESSOV3	SN: 3205	30-Apr-10 (No. ESI3-3205, Apr10)	April 11
	SN: 001		
AE4		10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
econdary Standards	10 #	Check Date (in house)	Jun-11 Scheduled Check
econdary Standards Ower sensor HP 8481A	ID # MY41082317	Check Date (in house) 18-Oct-02 (in house check Oct-00)	Jun-11 Scheduled Check In house check: Oct-11
lecondary Standards Tower sensor HP 6481A 9° generator P&S SMT-06	MY41082317 100005	Check Date (in-house) 18-Oct-02 (in-house check Oct-09) 4-Aug 99 (in-house check Oct-09)	Jun-11 Scheduled Check In Fouse check: Oct-11 In Fouse check: Oct-11
lecondary Standards Tower sensor HP 6481A N° generator R&S SMT-06	MY41082317	Check Date (in house) 18-Oct-02 (in house check Oct-00)	Jun-11 Scheduled Check In house check: Oct-11
Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	MY41082317 100005	Check Date (in-house) 18-Oct-02 (in-house check Oct-09) 4-Aug 99 (in-house check Oct-09)	Jun-11 Scheduled Check In Fouse check: Oct-11 In Fouse check: Oct-11
Secondary Standards Power sensor PP 8481A RF generator PBS SMT-06 Network Analyzer HP 6753E Calibrated by	MY41092317 100005 US37290585 S4206 Name	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)	Scheduled Check In Fouse check: Oct-11 In Fouse check: Oct-11 In Fouse check: Oct-11
Secondary Standards Power sensor PP 8481A RF generator R&S SMT-05 Network Analyzer HP 8753E	MY41092317 100005 US37290585 S4206 Name	Check Date (in-house) 18-Oct-02 (in-house check Oct-00) 4-Aug 99 (in-house check Oct-09) 18-Oct-01 (in-house check Oct-10) Function	Scheduled Check In-house check: Oct-11 In-house-check: Oct-11 In-house-check: Oct-11

Certificate No: D750V3-1001_Jan11

Page 1 of 6

This calibration certificate shall not be reproduced except in full without written approval of the laboratory



47(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of

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





eigerischer Kalibrierd Service suisse d'étalonnage Sarvinia sylapara di taratura **Swiss Calibration Service**

According by the Swiss Accorditation Sensor (SAS)

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

Accreditation No.: SCS 108

Glossary:

TSL ConvF N/A

tissue simulating liquid

sensitivity in TSL / NORM x,y,z 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
- EC 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
- 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.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate	Mou	DISOVO	1001	Junt
-------------	-----	--------	------	------

Page 2 of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **48(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

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 mhoim ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm² (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.12 mW / g
SAR normalized	normalized to TW	8.48 mW / g
SAR for nominal Head TSL parameters	normalized to TW	8.36 mW/g x 17.0 % (k-2)

SAR averaged over 10 cm2 (10 g) of Head TSL.	condition	
SAR measured	250 mW input power	1.38 mW / g
SAR normalized	normalized to TW	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

Page 3 of 6



49(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

FCC ID: RTS-6026-1302-13 L6ARFL110LW

2503A-RFL110LW

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 ms	

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



50(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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; $\sigma = 0.91 \text{ mho/m}$; $\epsilon_i = 42.3$; $\rho = 1000 \text{ kg/m}^3$

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)

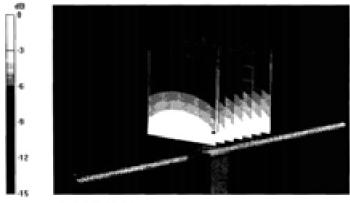
Pin=250mW; dip=15mm; dist=3.0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

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/gMaximum value of SAR (measured) = 2.48 mW/g



0 dB = 2.48 mW/g

Certificate No: D750V3-1021_Jan11

Page 5-of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Fage **51(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

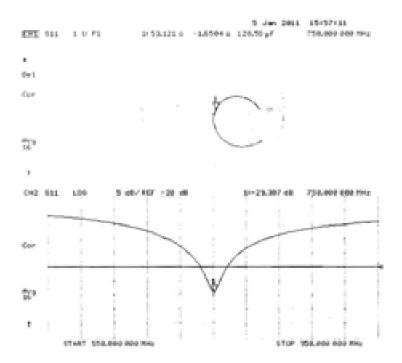
Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1021_Jan11

Page 6 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

52(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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





Schweizerischer Kalibrierdienst
 Service suisse-dittsionnage
 Service suissero di taratura
 Series Calibration Service

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

Client RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D750V3-1021_Jan13

Object	D750V3 - SN: 10	21 (5) (21) (4) (4) (4) (5) (6)	
Calibration procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	January 07, 2013		
Dis calibration certificate docum	works the traceability to neith	lonal standards, which resilies the physical un-	its of measurements (Si).
		nobability are given on the following pages an	
II collection have been contain	etical in the element inhomic	ry facility: environment temperature (22 x 3)*C	Canad Incompletes at 1999).
			A SECURITY OF THE PROPERTY OF
Calibration Equipment used (MS	TE critical for calibration)		
Primary Standards	Dr	Cal Date (Certificate No.)	Scheduled Calibration
*Yimary Standards *Power meter EPM-HCM	ID # GR07480704	01-Nov-12 (No. 217-01640)	Oxi-13
Primary Standards Power mater EPM-442A Power semoor HP 8481A	ID # G857460704 U637290783	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oxi-13 Oxi-13
Primary Standards Power motor EPS-H4DA Power sensor HP B481A Reference 20-dB Attenuator	ID # GREETHEOTON UKSTONOTHIO SNL SOSIB (2014)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Nav-12 (No. 217-01630)	Oxt-13 Oxt-13 Apr-13
Primary Standards Power meter EP84-442A Power sensor HP 8481A Reference 20-dB Attenuator Type-N mismatch combination	ID # G8037460704 U637290785 SN: 5056 (201) SN: 5047.3 / 06007	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. 217-01600)	Oxi-13 Oxi-13 Apr-13 Apr-13
Primary Standards Power meter EPM-44DA, Power sensor IAP MidTA, Pelesence 20-48 Attenuator Type-N miumaton combination Reference Prube ES30V3	ID # GREETHEOTON UKSTONOTHIO SNL SOSIB (2014)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Nav-12 (No. 217-01630)	Oxt-13 Oxt-13 Apr-13
Primary Standards Power meter EPM-440A Power sensor HP 8481A Reference 20-88 Attenuator Pype-N mismatch combination Reference Probe ESSOV3 AAEA	ID # G8037490704 U637390790 SN: 5046 (200) SN: 5047.3 / 06007 SN: 3005 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. 217-01600) 29-Oec-12 (No. ESS-3005, Dec12) 27-Jun-12 (No. DAE4-601, Jun12)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jun-13
Primary Standards Power meter EPM-H45A Power sensor HP 8481A Reference 20 dB Attenuator Typo-N miumatch combination Reference Probe ESSOV3 DACA Secondary Standards	ID # G8037460704 U637390790 SN: 5056 (20%) SN: 5047.3 / 06327 SN: 3205 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. 217-01630) 29-Dec-12 (No. ESS-3205 (Dec12) 27-Jun-12 (No. DAE4-601 (Jun12) Check Date (in house)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jun-13 Sicheduled Check
Primary Standards Power meter EPS4-HDA Power sensor HP 8481A Reterence 20-89 Attenuator Type-N inturnation continuation Reterence Probe ES30V3 DA6A Secondary Standards Power sensor HP 8481A	ID # G8037490704 US37390790 SN: S058 (20%) SN: S058 (20%) SN: S057 3 / O8027 SN: 3005 SN: 601 ID # MY41000317	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. 217-01600) 29-Dec-12 (No. E38-3205, Dec12) 27-Jun-12 (No. E38-3205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date (in house)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jun-13 Sicheduled Check In house check: Oxi-13
Primary Standards Power meter EPSA-HSSA. Power sensor HP 8481A. Reterence 20-89 Attenuator Sypc-N misurcatch combination Reterence Probe ES30V3 DAG4 Secondary Standards Power sensor HP 8481A. RF generator R&S SMT-06	ID # G8037460704 U637390790 SN: 5056 (20%) SN: 5047.3 / 06327 SN: 3205 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. 217-01630) 29-Dec-12 (No. ESS-3205 (Dec12) 27-Jun-12 (No. DAE4-601 (Jun12) Check Date (in house)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jun-13 Sicheduled Check
Primary Standards Power meter EPSA-HSSA. Power sensor HP 8481A. Reterence 20-89 Attenuator Sypc-N misurcatch combination Reterence Probe ES30V3 DAG4 Secondary Standards Power sensor HP 8481A. RF generator R&S SMT-06	ID # G8037490704 US32392783 SN: 5047.37 (68027 SN: 5047.37 (68027 SN: 5047.37 (68027 SN: 601 ID # MYH 1000317 100005 US32390585 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. E38-3005 Dect2) 28-Dec-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 18-Oct-02 (In house theck Oct-11) 04-Aug-99 (in house theck Oct-11) 18-Oct-01 (in house theck Oct-12)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jul-13 Sicheduled Check In Incuse check: Oxi-13 In house check: Oxi-13 In house check: Oxi-13
Primary Standards Power meter EPSA-440A Power sensor HP 8481A Reference 20-88 Attenuator Vape-N mismatch combination Reference Probe ESSOV3 SAEA Recondary Standards Power sensor HP 8451A If generator R&S SMT-66 Network Analyser HP 8753E	ID # G8037490704 US37390790 SN: 5047:37 (06027 SN: 3005 SN: 001 ID # MYN 10003177 100005 US37390586 S4306 Mame	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. ESS-2005 (Dect2) 28-Dec-12 (No. ESS-2005 (Dect2) 27-Jun-12 (No. ESS-2005 (Dect2) 27-Jun-12 (No. ESS-2005 (Dect2) 18-Oct-02 (in house (heck Oct-11) 04-Aug-09 (in house (heck Oct-11) 18-Oct-01 (in house (heck Oct-12)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jun-13 Sicheduled Check In Incuse check: Oxi-13 In house check: Oxi-13
Calibration Equipment used (MS Primary Standards Power meter EPSA-440A Power sensor HP 8481A Reference 20-85 Attenuator Type-N mismatch combination National Probe ES3CV3 DASA Secondary Standards Power sensor HP 8481A RF generator RSS (SMT-05 Network Analyser HP 8753E	ID # G8037490704 US32392783 SN: 5047.37 (68027 SN: 5047.37 (68027 SN: 5047.37 (68027 SN: 601 ID # MYH 1000317 100005 US32390585 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. E38-3005 Dect2) 28-Dec-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 27-Jun-12 (No. E38-3005 Dect2) 18-Oct-02 (In house theck Oct-11) 04-Aug-99 (in house theck Oct-11) 18-Oct-01 (in house theck Oct-12)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jul-13 Sicheduled Check In Incuse check: Oxi-13 In house check: Oxi-13 In house check: Oxi-13
Primary Standards Power meter EPSM-H42A Power sensor HP 8481A Reference 20-85 Attenuator Type-N mismatch combination Reference Probe ESSOV3 DAEA Secondary Standards Power sensor HP 8451A RF generator RES SMT-95 Network Analyser HP 8753E	ID # G8037490704 US37390790 SN: 5047:37 (06027 SN: 3005 SN: 001 ID # MYN 10003177 100005 US37390586 S4306 Mame	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01600) 27-Mar-12 (No. ESS-2005 (Dect2) 28-Dec-12 (No. ESS-2005 (Dect2) 27-Jun-12 (No. ESS-2005 (Dect2) 27-Jun-12 (No. ESS-2005 (Dect2) 18-Oct-02 (in house (heck Oct-11) 04-Aug-09 (in house (heck Oct-11) 18-Oct-01 (in house (heck Oct-12)	Oxi-13 Oxi-13 Apr-13 Apr-13 Dec-13 Jul-13 Sicheduled Check In Incuse check: Oxi-13 In house check: Oxi-13 In house check: Oxi-13

Certificate No: D750V3-1021_Jan13

Page 1 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **53(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

C

2503A-RFL110LW

Calibration Laboratory of

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





S Schweizerlacher Kalibrierdienst

Service suisse d'étalonnage

Servicio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL

tissue simulating liquid

ConvF N/A sensitivity in TSL / NORM x,y,z 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
- EC 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.

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%.

Certificate No: D750V3-1001 Jan 13

Page 2 of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **54(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	V52.8.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz n 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	41.4 ± 6 %	0.89 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	2.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.46 W/kg = 17.0 % (ke2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.51 W/kg a 16.5 % (k+2)

Certificate No: D750V3-1021_Jan13

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **55(119)**

Repo

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.7 Q - 0.2 JQ
Return Loss	- 25.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 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-signats. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAPI data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the clipcle 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_Jan13

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Fage **56(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No **RTS-6026-1302-13**

L6ARFL110LW

FCC ID:

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date: 07.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 750 MHz.

Medium parameters used: f = 750 MHz; $\sigma = 0.89 \text{ S/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

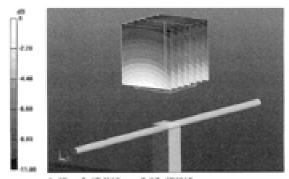
DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.28, 6.28, 6.28); Calibrated: 28.12.2012;
- Senser-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 54.107 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 3.23 W/kg SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.38 W/kg

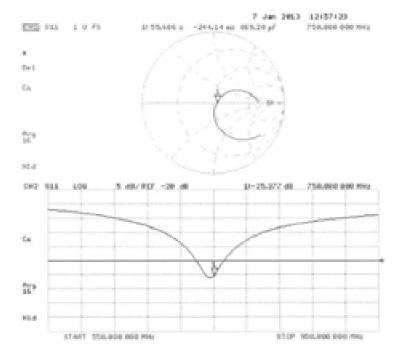
Maximum value of SAR (measured) = 2.47 W/kg



0 dB = 2.47 W/kg = 3.93 dB/W/kg



Impedance Measurement Plot for Head TSL





Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **58(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

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





S Schweizerlacher Kalibrierdien Service suisse d'étalonnage Servicio ovizzero di taratura S Swiss Celibration Service

Accredited by the Swiss Accreditation Service (SAS)

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

Client RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificite No: D835V2-446 Jan11

Poject	D835V2 - SN: 44	6	
albration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
Selbration date:	January 21, 2011	r in de galacer	
No. calibrative cartificate decrees	ants the transmittel to red	onal standards, which realize the physical ur	de of manufacture (SI)
		robability are given on the following pages ar	
			David Street Street
Il calibrations have been conduc	sted in the closed inborato	ry facility: environment temperature (22 x 3)*	C and humidity < 70%.
Il calibrations have been conducted to the calibration Equipment used (MS)		ry facility: anxironment temperature (22 x 3)*	C and humidity < 70%.
altration Equipment used (MS)	TE oritical for calibration)		
albration Equipment used (MST	E critical for celibration)	Cal Code (Certificate No.)	Scheduled Calibration
albration Equipment used (MET rimory Standards Ower meter EPM-442A	E onticel for celibration) 10 # G832480704	Cal Date (Certificate No.) 96-Oct-10 (No. 217-01266)	Schoolded Calibration Oct-11
albration Equipment used (MST rimary Standards Ower meter EPM-442A Ower sensor HP 8481A	TE critical for calibration) 10 # 0837480704 US37292783	Cal Date (Certificate No.) 06-Oct-10 (No. 217-01268) 06-Oct-10 (No. 217-01268)	Scheduled Calibration Oct-11 Oct-11
sibration Equipment used (MST imary Standards ower meter EPM-442A ower sensor HP 8481A eference 20 dB Attenuator	TE critical for calibration) 10 # 0(007480704 US37292763 SN: 5086 (20g)	Cal Date (Certificate No.): 06-Oct-10 (No. 217-01268) 06-Oct-10 (No. 217-01268) 30-Mar-10 (No. 217-01158)	Scheduled Calibration Oct-11 Oct-11 Mar-11
albration Equipment used (MST firmary Standards ower meter EPM-442A ower sensor HP-8481A elenence 20 dB Atlanuator ype N mismatch combination	TE critical for calibration) ID # G832*480704 U637242783 SN: 5086 (20g) SN: 5047.2 / 06327	Cal Date (Certificate No.): 06-Oct 10 (No. 217-01268) 06-Oct 10 (No. 217-01268) 30-Mar-10 (No. 217-01168) 30-Mar-10 (No. 217-01162)	Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11
isibration Equipment used (ME) timery Standards timery mater EPM-442A. Ower sensor HP 8481A leference 20 dB Attenuator ype N mismatch combination eference Probe ESSOV3	TE critical for calibration) 10 # 0(007480704 US37292763 SN: 5086 (20g)	Cal Date (Certificate No.): 06-Oct-10 (No. 217-01268) 06-Oct-10 (No. 217-01268) 30-Mar-10 (No. 217-01158)	Scheduled Calibration Oct-11 Oct-11 Mar-11
sibration Equipment used (MEI imary Standards over meter EPM-442A over sensor HP 8481A stenence 20 dB Attenuator stenence Probe ES3CV3 AEA	TE critical for calibration) 1D # 0(937/460704 US37292783 SN: 5086 (20g) SN: 5087 2 / 06327 SN: 3205	Cal Date (Certificate No.): 09-Oct-10 (No. 217-01298): 09-Oct-10 (No. 217-01298): 30-Mar-10 (No. 217-01168): 30-Mar-10 (No. 217-01162): 30-Apr-10 (No. ESS-3205, Apr-10):	Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Agr-11
silbration Equipment used (MSI imary Standards over meter EPM-442A over sensor HP 8481A afonance 20 dB Atlenuator ope N mismatch combination attence Probe ES3GV3 NEA accordary Standards	TE critical for calibration) 10 # 0807480704 US37282783 SN: 5088 (20g) SN: 5047.2 / 06027 SN: 5047.8 (50) SN: 5047.8 (50)	Cal Cote (Certificate No.): 06-Oct-10 (No. 217-01256) 06-Oct-10 (No. 217-01256) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3255, Apr-10) 10-Jun-10 (No. DAE4-601, Jun10)	School/ed Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11
silbration Equipment used (MST firmery Standards ower meter EPM-642A ower sensor IPP 8481A stenence 20 dB Attenuator spe-N mismatch combination elseence Probe ES30V3 AEA econdary Standards ower sensor IPP 8481A	TE critical for calibration) 10 # G857480704 US37292763 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601	Cal Code (Certificate No.): 06-Oct-10 (No. 217-01266) 96-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3215, Apr-10) 10-Jun-10 (No. DAE4-601, Jun10) Check Date (in house)	School/ed Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 School/ed-Check
telebration Equipment used (MST frimary Standards over meter EPM-642A, fower sensor HP 8481A leterance 20 dB Atlanuator ype-N mismatch combination leterance Probe ESSOV3 AEA econdary Standards over sensor HP 8481A If generator HRS SMT-06	TE critical for calibration) ID # GBS7480704 USS7292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MN41092017	Call Date (Certificate No.): 06-Oct-10 (No. 217-01268) 06-Oct-10 (No. 217-01268) 30-Mar-10 (No. 217-01168) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3205, Apr-10) 10-Jun-10 (No. DAE4-601, Jun10) Gheck Date (in house check Oct-08)	Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11
	TE oritical for calibration) ID # G(6)27480704 US37292763 SN: 5086 (20g) SN: 5087 2 / 06327 SN: 3205 SN: 501 ID # MY41090317 100005	Call Date (Certificate No.): 06-Oct 10 (No. 217-01268) 06-Oct-10 (No. 217-01268) 06-Oct-10 (No. 217-01168) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. 217-01162) 30-Apr-10 (No. ESS-3215, Apr10) 10-Jun-10 (No. DAE-4601, Jun10) Check Date (in house check Oct-08) 4-Aug-99 (in house check Oct-09)	Scheduled Califoration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11
sibration Equipment used (MET fimory Standards over meter EPM-442A, over sensor HP 8481A elenence 20 dB Attenuator spe-N mismatch combination attences Probe ESSDV3 AEA econdary Standards over sensor HP 8481A F generator RBS SN/T-46 elexork Analyses HP 8753E	TE critical for calibration) ID # G83274802704 US37292783 SN: 5086 (20g) SN: 5085 (20g) SN: 5085 SN: 6011 ID # MN#100005 US37380585 \$4206	Cal Code (Certificate No.): 96-Oct-10 (No. 217-01298) 96-Oct-10 (No. 217-01298) 90-Mar-10 (No. 217-01168) 90-Mar-10 (No. 217-01162) 90-Apr-10 (No. 659-3216, Apr-10) 10-Jun-10 (No. DAE4-601, Jun16) Oheck Date (in house) 18-Oct-02 (in house check Oct-08) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09)	Scheduled Califoration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11
Calibration Equipment used (MST Trimery Standards Tower meter EPM-442A, Tower sensor HP 8481A leterance 20 dB Atlanuator (ppe-N mismatch combination leterance Probe ESSOV3 (AEA secondary Standards Tower sensor HP 8481A (Figenessor HSS SMT-06)	TE critical for calibration) ID # G8537480704 US37292783 SN: 5086 (20g) SN: 5087 2 / 06327 SN: 5085 SN: 601 ID # MN:41090317 100005 US37380585 \$4206	Cal Date (Certificate No.): 06-Oct-10 (No. 217-01256) 06-Oct-10 (No. 217-01256) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. 653-3205, Apr-10) 10-Jun-10 (No. DAE-4601, Jun16) Oheck Date (in house) 18-Oct-02 (in house check Oct-08) 6-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09)	Scheduled Califoration Oct-11 Oct-11 Mar-11 Mar-11 Agr-11 Jun-11 Scheduled Check In house sheck: Oct-11 In house check: Oct-11

Certificate No: D805V2-446_Jan/11

Page 1 of 6



59(119)

Author Data Andrew Becker Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

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





Service suisse d'étatonnage Servizio svizzeno di teratura Swiss Calibration Service

Accorditation 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 N/A

sensitivity in TSL / NORM x,y,z

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
- 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
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Dertificate No: D835V2-446 Jan11	Page 2 of	6



Appendix D for the BlackBerry ${\bf @}$ Smartphone Model RFL111LW SAR Report

Page **60(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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	805 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 ² (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 x 16.5 % (k×2)

Certificate No: D836V2-446_Jan11

Page 3 of 6



61(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

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 teedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 24, 2001

Certificate No: D636V2-446_Jan11

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **62(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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; $\sigma = 0.89$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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: QD0000P49AA; 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

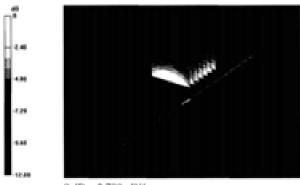
grid: dx=5mm, dy=5mm, dz=5mm

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: D805V2-445_Jan11

Page 5 of 6



Appendix D for the BlackBerry $\mathbin{\hbox{\it @}}$ Smartphone Model RFL111LW SAR Report

Page **63(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

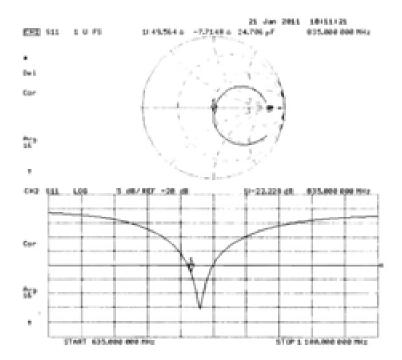
Test Report No **RTS-6026-1302-13**

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan11

Page 6 of 6



64(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

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





Schweizerlocher Kalibrierdienst s Service suisse d'étalonnage Ċ Servizio svizzero di taratura Swiss Calibration Service

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

Multilateral Agreement for the recognition of calibration certificates

RTS (RIM Testing Services)

Accessitation No.: SCS 108

Certificate No: D835V2-446_Jan13

Nijest	D835V2 - SN: 44	6 10 10 10 10 10 10 10 10 10 10 10 10 10	
Calibration procedure(x)	QA CAL-05.v9	dure for dipole validation kits abo	oun 700 MHz
		out out depote remaind out and	
Sulbration date:	January 07, 2013	polytikijos u oprpilati late	
		onal standards, which realize the physical un scholally are given on the following pages as	
		y facility: environment temperature (32 x 3)*1	
Salibration Equipment used (M&)	E ortical for calibration)		
	TE critical for calibration)	Cal Date (Certificate No.)	Scheduled Colloration
nimary Standards		Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640)	Scheduled Calibration Oct-13
timary Standards Over meter EPM-442A Over sensor HP 8481A	ID # 0807480704 U037290780	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct-13 Oct-13
timary Standards Over meter EPM-442A Over sensor HP 8481A	60 # G857460704 UG37292780 SAL 5056 (30k)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530)	Oct-13 Oct-13 Apr-13
remary Standards Swer meter EPM-442A Over sensor HP 5461A Inference 20 dB Atlenuator	ID # 0807480704 U037290780	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct-13 Oct-13
timary Standards Ower mater EPM-HIDA Over sensor HP SHB1A Harmone 20 dB Adenuator yye N mismatch combination laterance Probe ESSEV3	ID # G832/480704 US37290783 SM 5058 (30k) SM 5047.3 / 06387 SM 5047.3	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ESS-3305, Dec10)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13
timary Standards Ower mater EPM-H42A Ower sensor HP 8481A Interests 20 dB Adenuator type-N mismatch combination televance Probe ES30V3	ID # G897490704 US37290783 SM: 5058 (30%) SM: 5047.3 / 06307	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530)	Oct-13 Oct-13 Apr-13 Apr-13
timary Standards Swer meter EPM-442A Over sensor 19*8451A elemence 20 dB Atlenuator type N mismatch combination laterance Probe ESGOVO A6!4	ID # G832/480704 US37290783 SM 5058 (30k) SM 5047.3 / 06387 SM 5047.3	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ESS-3305, Dec10)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13
himary Standards Power meter EPM-442A Power sensor HP 8485A fatherence 20 dB Attenuator Type-N mismatch combination fetherence Probe ESSEV3 MAE4 Jecondary Standards	ID # G857480704 UG37290789 SM: 5058 (504) SM: 5047.3 / 66507 SM: 5095 SM: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-3005, Dec10) 27-Jun-12 (No. DAE4-601, Juni2)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13
trimary Standards Tower tester EPM-442A Tower sensor HP 8480A testerence 20 dB Attenuator type-N mismatch combination felterence Probe ESSOV3 AAE4 lecondary Standards Tower sensor HP 8480A	ID # G857480704 UG37290785 SM 5056 (20K) SM 5047.3 / 06587 SM 3005 SM 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-3906, Dec10) 27-Jun-12 (No. DAE4-601, Jun12) Check Date (In house)	Oct-13 Oct-13 Apr-13 Apr-13 Date-13 Arn-13 Scheduled Check
himary Standards Power meter EPM-442A Tower sensor HP 8480A feterence 20 dB Attenuator Type-N mismatch combination feterence Probe ES30V3 M64 Iecondary Standards Tower sensor HP 8480A 8° generator R&S SMT-96	ID # G857480704 UG37290785 SM S058 (20k) SM S047.3 / 06507 SM 3005 SM 601 ID # MYH1080317	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ESS-3905, Dec10) 27-Jun-12 (No. DAEA-4601, Junh2) Check Date (In-house) 18-Ost-02 (In-house check Ost-11)	Oct-13 Oct-13 Age-13 Age-13 Dec-13 Aun-13 Scheduled Check In house check: Oct-13
romary Standards Sues meter EPM-442A Sues sensor HP 8480A seterance 20 dB Attenuator yye N mismatch combination seterance Probe ESSEV3 A6-4 iecondary Standards Sues sensor HP 8480A Ef generator R&S SMT-96	ID # 0807480704 U037290783 SM 5058 (20%) SM 5047.3 / 06007 SM 3006 SM 601 ID # MYH1000317 100006	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-3205, Dec12) 27-Jun-12 (No. DAE4-601, Junh2) Check Date (In-house) 18-Ost-02 (in-house check Oct-11) 04-Aug-99 (in-house check Oct-11)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Aun-13 Scheduled Check In frouse check: Oct-13 In house check: Oct-13
himary Standards Tower tester EPM-442A Tower sensor HP 8485A fellerance 20 dB Afterwator Type-N mismatch combination fellerance Probe ES3CV3 SAE4 Jecondary Standards Tower sensor HP 8485A B' generator R&S SMT-06 setwork Analyzer HP 8753E	ID # G857480704 UG37290785 SM 5058 (XXX) SM 5047.3 / 06307 SM 5010 SM 601 ID # MYH 1000317 100005 UG373100685 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 257-01530) 28-Dec-12 (No. ES3-3005, Dec10) 27-Jun-12 (No. DAE4-601, Juni2) Gheck Date (In house) 18-Ost-02 (In house check Oct-11) 04-Aug-99 (In house check Oct-11) 18-Ost-01 (In house check Oct-11)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-13
astoration Equipment used (MS) **Initiatry Standards **Power states EPI4-642A **Invest sensor HIP 8480A **Invest sensor HIP 8480A **Initiation on HIP 8480A **Initiation on HIP 8480A **Initiation of HIP 8480B **Initiation of HIP 8	ID # G857480704 UG37290795 SM 5058 (90%) SM 5047.3 / 063027 SM 5010 ID # MYH1000317 100005 UG37390585 \$4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 237-01530) 28-Dec-12 (No. ES3-3995, Dec10) 27-Jun-12 (No. DAE4-601, Juni02) Check Date (In-house) 18-Out-02 (In-house check Oct-11) 04-Aug-99 (In-house check Oct-11) 18-Out-01 (In-house check Oct-12)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-13

Certificate No: D835V2-446_Jan/13

Page 1 of 6



65(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

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





Schwelzerischer Kalibrierdienst 鬼 Service suisse d'étalonnage C

Servizio svizzero di teratura 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 Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

ConvF N/A

sensitivity in TSL / NORM x,y,z 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
- 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.

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%.

Certificate No: D635V2-446_Jan13

Page 2 of 6



66(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	V52.8.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz a 1 MHz	

Head TSL parameters

The fello

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mholm
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.92 mhoim ± 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	2.38 Wikg
SAR for nominal Head TSL parameters	normalized to 1W	9.39 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.13 W/kg a 16.5 % (k=2)

Certificate No: D835V2-445_Jan13

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **67(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 6.5 jΩ
Return Loss	- 23.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Messurement Conditions" paragraph. The SAPI data are not affected by this change. The overall dipole length is still according to the Standard.

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: D635V2-446_Jan/13

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **68(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date: 07.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 42$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.05, 6.05, 6.05); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

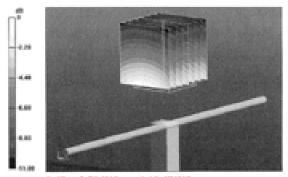
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 56.650 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.61 W/kg

SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 2.79 W/kg



0 dB = 2.79 W/kg = 4.46 dBW/kg



Page **69(119)**

Author Data
Andrew Becker

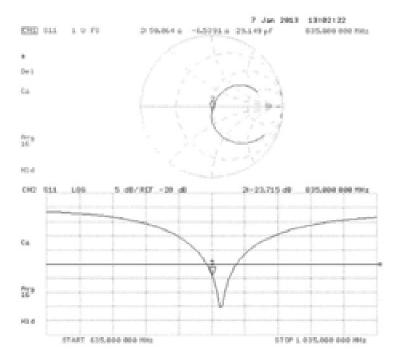
Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan13

Page 6 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **70(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG Zrughaustessa 43, 9004 Zurice, Svitzerland





S Schweizerischer Kalibriendenst
C Service suisse d'élatonenge
Service existee d'élatonenge
S Selas Calibration Service

Issued April 7, 2011

Accredited by the Swiss Accreditation Service (SAS).

The Swiss Accreditation Service is one of the signeturies to the SA swittlewest Agreement for the recognition of cellbration certificates.

Cited RTS (RIM Testing Services)

Accreditation No.: SCS 108

Cartiflosia No: D635V2-4d043_Apr11

CALIBR	RATION	CERTIF	ICATE

Otyanii D835V2 - SN: 4d043

Califration procedurals) QA CAL-05.v8

Calibration procedure for dipole validation kits

Calibration date: April 07, 2011

This collaration conflicute documents the tracoubility to national standards, which realize the physical units of mediturements (Sis.). The measurements and the unconferrice with confidence protebility are given on the following pages and are part of the carbifolists.

All calibrations have been conducted in the closed laboratory facility, environment temperature (22 x 3)°C and humidity < 70%

Calibration Equipment used MATE critical for calibration)

Primary Standards	10.6	Onl Date (Contribute No.)	Schoduled Calibration
Power motor EP\$6-4/C/A	GRO/HERDYON	96-Ocs-10 (No. 217-01966)	Op-11
Power sensor HP MS1A	U887290790	06-Oct-10 (No. 217-01056)	Out-11
Reference 20 dB Attrouation	SN: 5005 (70g)	29-Mar-11 (No. 217-01368)	Apr-12
Type N miswatch combination	\$84,5047.2 / 060027	29-Mar-11 (No. 217-01571)	Apr-12
Pelerance Probe ES0017	SN: 3265	30 Apr 10 (No. ES3-2005, Apr 10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE#601 Jun10)	June 11
Secondary Standards	0.	Gheck Date (in house)	Scheduled Check
Power sensor HP 8481A	MY1410902317	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-0%)	in house check: Oct-11
Network Analysis INP 87508	US37790585 54296	18-Oct-01 (in house throk Oct-15)	In house check: Oct-11
	Name	European	Signature
Celtrolled by:	Jeton Kaelneti	Laboratory Technician	J- Ve
Account by	Keta Pokodo	Testivine Manager	2014

Certificate No: D835V2-46043_April 1

Page 1 of 6

This calibration certificate shall not be reproduced except in full without written approve of the laboratory



71(119)

FCC ID: Author Data Dates of Test Test Report No 2503A-RFL110LW Andrew Becker Nov 22 2012 – Feb 28 2013 RTS-6026-1302-13 L6ARFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG Zeoghnossirossa 43, 8004 Zurich, Switzertend





Schweizerischer Kalibrierdieset 8 Service suisse d'étatos O.

Servido avizzero di terature Swins Calibration Service

Accomplisation No. 1 SCS 108

Accredited by the Swiss Aponditation Senior (SAS) The Swise 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:

- 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
- 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.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Page 2 of 6

Certificate No: D635V2-4d043_Apr11



Appendix D for the BlackBerry ${\bf @}$ Smartphone Model RFL111LW SAR Report

Page **72(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

W

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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	935 MHz a 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 mbo/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40,6 ± 6 %	0.86 mbo/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C		_

SAR result with Head TSL

SAR averaged over 1 cm* (1 g) of Heed TSL	Condition	
SAR measured	250 mW input power	2:33 mW / g
SAR normalized	normalized to TW	9:32 mW / g
SAR for nominal Head TSL parameters	normalized to TW	9.43 mW /g = 17.0 % (k-2)

SAR averaged over 10 cm ³ (10 g) of Hoad TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR normalized	normalized to TW	6.06 mW / g
SAR for nominal Head TSL parameters	normalized to TW	6.14 mW/g a 16.5 % (k=2)

Certificate No: D835V2-4d043_Apr11

Page 3 of 6



73(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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

Electrical Delay (one direction) 1 391 ns

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

The dipote 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 expessive 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 depole has been modified with Totion 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: D835V2-4d9E3_Apr11

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

74(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

DASYS Validation Report for Head TSL

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; $\sigma = 0.88$ mho/tr; $\epsilon_r = 40.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3205; CoevF(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

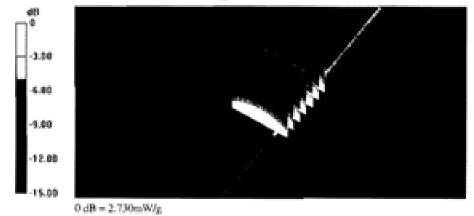
Measurement SW: DASY52, V52.6.2 Build (424)

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/gMaximum value of SAR (measured) = 2.730 mW/g

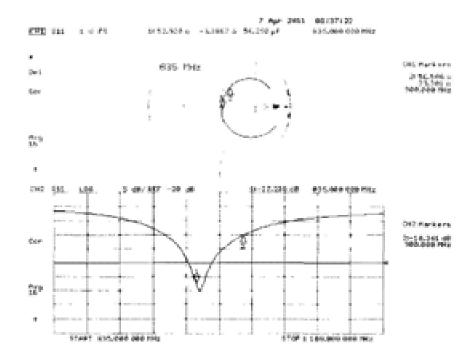


Certificate No: D835V2-4d043_Apr11

Page 5 of 6



Impedance Measurement Plot for Head TSL



Certificate No: D835V2-4s043_Apr11

Page 6 of 6



76(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner Engineering AG





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

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

¢

Certificate No: D1800V2-2d020_Jan11

Xiject	D1800V2 - SN: 2	4020	Allegan St. Commercial St.
Salibration procedure(s)	QA CAL-05.v8 Calibration proces	dure for dipole validation kits	
		A TAMES AND THE RESERVE OF SE	
Calibration date:	January 13, 2011	Color Wash Edinbane	
The measurements and the unce	stainties with confidence pa and in the closed laborator	onal standards, which realize the physical un robability are given on the following pages an sy facility: environment temperature (22 ± 3)*1	nd are part of the certificate.
imany Standards	lipe	Cal Date (Certificate No.)	Scheduled Californian
	ID # G607460704	Cal Date (Certificate No.) 05-Oct-10 (No. 217-01266)	Scheduled Calibration Oct-11
ower mater EPM-442A	177		
Ower meter EPM-442A Ower sensor HP 8481A	G837486704	06-0xt-10 (No. 217-01266)	Od-11
Power mater EPM-442A Power sensor HP 8481A Reference 20:d8 Afterwator	G897486704 U537292793	06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266)	Od-11 Od-11
Power meter EPM-442A Power sansor HP 8481A Reference 20 dB Attenuator Igne-N mismatch combination	G807480704 U637292793 SNL 5086 (20g)	06-Oct-10 (No. 217-01286) 06-Oct-10 (No. 217-01286) 30-Mar-10 (No. 217-01158)	Oct-11 Oct-11 Mar-11
Power mater EPM-443A Power sensor HP 8481A Reference 20 dB Attenuetor Type-N mismatch combination Reference Probe ESSOVO	G65749670A U537292765 SN: 5086 (20g) SN: 5047.2 / 06327	06-Oxt-10 (No. 217-01296) 06-Oxt-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162)	Oct-11 Oct-11 Mar-11 Mar-11
Power mater EPM-442A Power sensor HP 8481A Reference 20-05 Attenuator Type-N mismisch combination Reference Probe ESSOV3 24654	G8037480704 U537292783 SNt 5086 (20g) SNt 5047.2 / 06327 SNt 3205	96-Oxi-10 (No. 217-01296) 96-Oxi-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205, Apr10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11
Power motor EPM-442A Power sensor HP 8481A Reference 20 48 Attenuator Type-N mismisch combination Reference Probe ESSOV3 DAEA Secondary Standards	G857480704 US37292783 SM: 5086 (20g) SM: 5047.2 / 06327 SM: 3205 SM: 601	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01198) 30-Mar-10 (No. 217-01192) 30-Apr-10 (No. 553-3205, Apr10) 10-Jun-10 (No. DAS-6401, Jun10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11
Power mater EPM-442A Power sensor HP 8481A Reference 20 4B Attenuator Type-N mismisch combinator Reference Probe ESSOV3 2464 Recondary Standards Power sensor HP 8481A	G807480704 US37292763 SRL 5086 (20g) SRL 5047 2 / 06327 SRL 3205 SRL 601	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01160) 30-Apr-10 (No. ESS-3205, Apr10) 10-Jun-10 (No. DAE-6601, Juni0) Check Date (in house)	Oct-11 Oct-11 Mar-11 Mar-11 Agr-11 Jun-11 Scheduled Check
Power mater EPM-442A Power sensor HP 8481A Reference 20:40 Attenuator Type-N mannatch combination Reference Probe ESSOV3 DAEA Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	G807480704 US37292765 SAL 5086 (20g) SAL 5086 (20g) SAL 5005 SAL 601 ID-# MYK1000317	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01168) 30-Apr-10 (No. ESS-3205, Apr-10) 10-Jun-10 (No. DAE-6601, Juni0) Check Date (in house)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Aur-11 Scheduled Check In Nouse sheck: Oct-11
Primary Standards Power mater EPM-442A Power sensor HP 8481A Polentone 20:45 Afteruator Type-N mismatch combination Reference Probe ESSOV3 DAEA Secondary Standards Primar sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	G807480704 U637292763 SAL 5086 (20g) SAL 5086 (20g) SAL 5005 SAL 601 ID # MYK1000317 100005	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01198) 30-Mar-10 (No. 217-01198) 30-Apr-10 (No. ESS-3206, Apr10) 10-Jun-10 (No. DAE-4601, Jun10) Check Date (in house) 18-Oct-22 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-09) Function	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Apr-11 Aur-11 Scheduled Check In house check: Oct-11 In house check: Oct-11
Power motor EPM-442A Power sensor HP 8481A Polenece 20 48 Afterwator Fype-N mismistic combination Reforence Probe ESSOV3 2AEA Secondary Standards Power sensor HP 8481A RF generator PAES SWT-06 National Analyses HP 8753E	G807480704 US37292765 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3005 SN: 601 ID: # MYK1000317 100005 US37390586 SK206	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 237-01168) 30-Apr-10 (No. ESS-3205, Apr-10) 10-Jun-10 (No. DAE-4-601, Juni0) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-90 (in house check Oct-09) 18-Oct-01 (in house check Oct-00) 18-Oct-01 (in house check Oct-10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Apr-11 Aur-11 Scheduled Check In house sheck: Oct-11 In house sheck: Oct-11
Power mater EPM-442A Power sensor HP 8481A Reference 20:40 Attenuator Type-N mannatch combination Reference Probe ESSOV3 DAEA Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	G857480704 US37292765 SAL 5086 (20g) SAL 5086 (20g) SAL 5005 SAL 601 ID-# MWK1000317 100005 US37290585 SA206 Name Omosiliae	06-Oct-10 (No. 217-01296) 06-Oct-10 (No. 217-01296) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 237-01168) 30-Apr-10 (No. ESS-3205, Apr-10) 10-Jun-10 (No. DAE-4-601, Juni0) Check Date (in house) 18-Oct-02 (in house check Oct-09) 4-Aug-90 (in house check Oct-09) 18-Oct-01 (in house check Oct-00) 18-Oct-01 (in house check Oct-10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11 In house check: Oct-11

Certificate No: D1800V2-26020_Jan/11

Page 1 of 6



77(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of

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





Schweizerlacher Kalibrierdienst 50 Service suisse d'étalonnage ¢ Servicio svizzero di tanatura **Swiss Calibration Service**

Accorditation No.: SCS 108

Accredited by the Swiss Accreditation Senior (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 N/A

sensitivity in TSL / NORM x,y,z 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
- 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
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No. D1800V2-26020_Jan11	Page 2 of 6		



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **78(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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	1800 MHz = 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

-	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1,40 mhoim
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.6 ± 6 %	1.36 mholm = 6 %
Head TSL temperature during test	(21.3 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.78 mW/ / g
SAR normalized	normalized to 1W	39.1 mW/ g
SAR for nominal Head TSL parameters	normalized to TW	39.2 mW /g = 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.13 mW/g
SAR normalized	normalized to 1W	20.5 mW / g
SAR for nominal Head TSL parameters	normalized to TW	20.5 mW /g x 16.5 % (kx2)

Certificate No: D1800V2-2d020_Jan/11

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

79(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

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

General Antenna Parameters and Design

Electrical Delay (one-direction)	1.216 ns

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

The dipole is made of standard semirigid coxxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 07, 2001

Certificate No: D1800V2-2x020_Jan/11

Page 4 of 6



80(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 12:34:12

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: f = 1800 MHz; $\sigma = 1.38 \text{ mho/m}$; $\varepsilon_c = 38.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

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

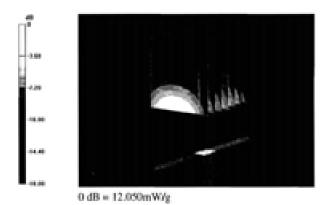
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.654 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 17.902 W/kg

SAR(1 g) = 9.78 mW/g; SAR(10 g) = 5.13 mW/gMaximum value of SAR (measured) = 12.051 mW/g



Certificate No: D1800V2-2d020_Jan11

Page 5 of 6

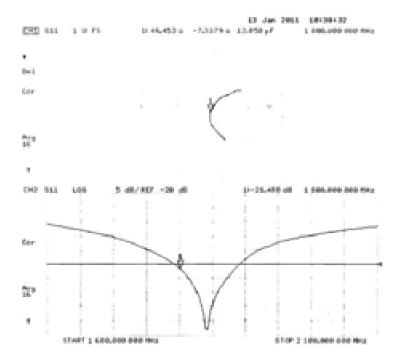


81(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: D1800V2-2d020_Jan11

Page 6-of 6



82(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

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





Schweizerischer Kalibrierdienst 9 Service suisse d'étalonnage C Servizio exizzero di taratura S Swiss Calibration Service

Accredited by the Swiss Accreditation Senice (SAS) The Swiss Accreditation Service is one of the signatories to the EA

Multillateral Agreement for the recognition of calibration certificates RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1800V2-2d020_Jan13

	CERTIFICATE		
Object	D1800V2 - SN: 2	14020	
Calibration procedure(s)		dure for dipole validation kits abo	
Cultivation date:	January 09, 2013	and serving	
		ional standards, which realize the physical un robability are given on the following pages ar	
ili calibratione have been condu	Sed in the crosed laboration	ry facility: environment temperature (22 x 3)*1	C and humidity < 70%.
	ME and the second second		
alibration Equipment used (MS	it. Orecal for calerations		
	D.	Cali Date (Cortificate No.)	Scheduled Calibration
rimary Standards		Call Date (Cortificate No.) 01-Nov-12 (No. 217-01640)	Sicheduled Calibration Oxl-13
rimary Standards ower mater EPM-442A	De		
rimary Standards Ower meter EPM-642A Ower sensor HP 8481A	ID # GBS7480704	01-Nov-12 (No. 217-01640)	Out-13
rimary Standards ower meter EPM-042A ower sensor HP 8481A eferance 20 dS Attenuator	ID # GB37480794 US3729078G	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Osl-13 Osl-13
rimary Standards tower meter EPM-042A tower sensor HP 8481A eference 20 dS Attenuator ype-N mismatch combination	ID # G837480794 U637290783 SP: 5058 (204)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630)	Oxi-13 Oxi-13 Apr-13
vinsary Standards oseer meter EPM-642A oseer sensor HP 6481A elferance 20 69 Attenuator poe-N mismatch combination elferance Probe ES30V3	ID # G837480794 US07290780 SPc 5058 (20k) SPc 5047.3 / 06397	01-Nov-12 (No. 217-01640) 01-Nov-17 (No. 217-01640) 27-Mar-12 (No. 217-0160) 27-Mar-12 (No. 217-01630)	Out-13 Out-13 Apr-13 Apr-13
rimary Standards ower meter EPM-142A ower sensor HP 8481A eference 20 d8 Attenuator you N mismatch combination eference Prote ESSOV3 AE4 econdary Standards	ID # G837480794 US37990783 SPc 5058 (204) SPc 5067.3 / 05397 SPc 3005	01-Nov-12 (No. 217-01640) 01-Nov-17 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Owo-12 (No. ESS-0205, Dec12)	Osi-13 Osi-13 Apr-13 Apr-13 Osi-13
remary Standards Ower meter EPM-142A Ower sensor HP 8481A efference 20 dS Attenuator goe-N mismatch-combination eference Prote ESSOV2 AE4 econdary Standards	ID # GB037480704 USS37592740 SPC SD58 (20k) SPC SD58 (20k) SPC SD67.3 / 06397 SPC SD65 SPC 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Oec-12 (No. ESS-2005, Dec12) 27-Jun-12 (No. DAE4-601, Jun12)	Ost-13 Ost-13 Apr-13 Apr-13 Dec-13 Jun-13
vinsary Standards oseir meter EPM-642A oseir sensor HP 6481A alference 20 68 Attenuator poe-N mismatch combination aference Probe ES30V3 AE4 econdary Standards oseir sensor HP 6481A Figenerator RES SMT-06	ID # GB07480704 UB37290780 SPC 5058 (20%) SPC 5057 37 05307 SPC 3005 SPC 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 29-Owo-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. GAE4-601, Jun12) Check Date (in house)	Ost-13 Ost-13 Apr-13 Apr-13 Dec-13 Jun-13
Veinary Standards Voier meter EPM-642A Voier sensor HP 8481A Interestor 20 68 Attenuator Igo N Interestor 100 Attenuator Igo N Interestor 100 Attenuator Inference Probe ES30V2 IAE4 Incordary Standards Voier sensor HP 8481A IF generator RES SME-06	ID # GB07480704 US07290760 SPC 5058 (20%) SPC 5050 (20%) SPC 5050 (20%) SPC 5050 (20%) SPC 5050 (20%) SPC 5050 (20%)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 29-Oso-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. CAEI4-601, Jun12) Check Date (in house) 18-Os0-02 (in house)	Osi-13 Osi-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13
Veinary Standards Voiser mater EPM-642A Voiser sensor HP 8481A Interence 20 dB Attenuator Igne-10 mismatch combination Inference Phote ES30V3 IAEA Incordary Standards Voiser sensor HP 8481A Ef generator PBS SMT-06 Interence Analyzer HP 8753E	ID # GB07480704 US07990763 SR: 5056 (20k) SR: 5047.31/06307 SR: 3005 SR: 601 ID # MY41002317 100005	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Osc-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Out-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	Osi+13 Osi+13 Apr+13 Apr+13 Dec+13 Jun-13 Scheduled Check In house check: Osi+13 In house check: Osi+13
vimary Standards Osser meter EPM-642A Osser sensor HP 6481A Intervince 20 68 Attenuator (gowN mismatch combination leference Probe ES30V2 IAE4 econdary Standards Osser sensor HP 6481A IF generator RES SMT-06	ID # GB037480704 USS37950790 SPC 5058 (20k) SPC 5067 (3 / 06007 SPC 5005 SPC 601 ID # MY4100005 USS37580585 S4006	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Osc-12 (No. ES3-2005, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date (in house) 16-Oct-07 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12)	Osi-13 Osi-13 Apr-13 Apr-13 Dec-13 Jun-13 Subschold Check In house check: Osi-13 In house check: Osi-13 In house check: Osi-13
vimary Standards Ower sensor HP 8481A Weer sensor HP 8481A Weer sensor HP 8481A Weersenso 20 dB Attenuator goe-10 mismatch combination wherenoe Probe ES20V3 AE4 econdary Standards cover sensor HP 8481A F generator RBS SMT-05 elevorik Analyzer HP 8753E	ID # GB037480704 USS7290740 SPC SDS8 (200) SPC SDS8 (200) SPC SDS9	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Oso-12 (No. ES3-3005, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) 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-12)	Osi-13 Osi-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oci-13 In house check: Oci-13 In house check: Oci-13 In house check: Oci-13

Certificate No: D1800V2-26020_Jan13

Page 1 of 6



83(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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





Schweigerischer Kalibrierdional Service suisse d'étalonnage C

Servicio evizpero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Sensor (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 N/A

sensitivity in TSL / NORM x,y,z not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- 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.

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%.

Certificate No: D1800V2-2d020, Jan 13

Page 2 of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **84(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	V52.8.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSI, parameters	22.0 °C	40.0	1.40 mholm
Measured Head TSL parameters	(22.0 ± 0.2) °C	30.9 ± 6 %	1.38 mhoim ± 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	9.61 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	38.5 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ⁸ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.06 W/kg
SAR for nominal Head TSL parameters	normalized to YW	20.3 W/kg a 16.5 % (ks-2)

Certificate No: D1800V2-2d020_Jan13

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

85(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.2 \Omega - 8.3 \mu
Return Loss	- 20.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.216 ns
----------------------------------	----------

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

The dipole is made of standard semirigid cossist costs. 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 07, 2001

Certificate No: D1800V2-2d020_Jan13

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **86(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID:

L6ARFL110LW

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date: 09.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1800 MHz

Medium parameters used: f = 1800 MHz; $\sigma = 1.38 \text{ S/m}$; $\varepsilon_r = 38.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

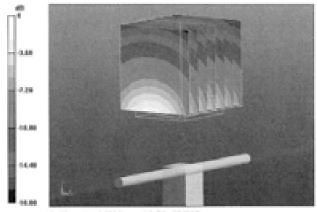
- Probe: ES3DV3 SN3205; ConvF(5.04, 5.04, 5.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012.
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 95.870 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 9.61 W/kg; SAR(10 g) = 5.06 W/kg Maximum value of SAR (measured) = 11.8 W/kg



0 dB = 11.8 W/kg = 10.72 dBW/kg

Certificate No: D1800V2-2d020_Jan13

Page 5 of 6



Andrew Becker

Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR

Test Report No

87(119)

Report

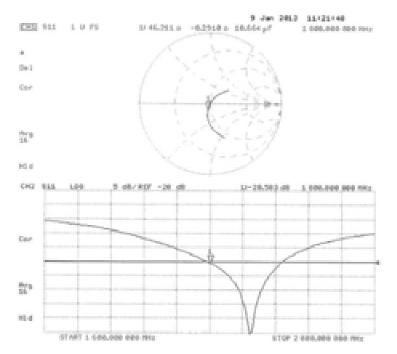
Dates of Test Nov 22 2012 – Feb 28 2013

FCC ID: RTS-6026-1302-13

L6ARFL110LW

2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: 01800V2-2d020_Jan13

Page 6-of 6



88(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

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





\$ Service suisse d'étalonnage Servizio svizzero di teratura Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS):

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

RTS (RIM Testing Services)

Accordination No.: SICS 108

Certificate No: D1900V2-545_Jan11

Mijnet	D1900V2 - SN: 5	#5 - February - Land Professor	Andrew Control
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
Calibration date:		Was Associated for the	and the second
		ional standards, which realize the physical un robubility are given on the following pages ar	
All calibrations have been condu	cted in the closed inbonsto	ry facility: environment temperature (22 x 3)?	C and humidity < 70%;
Calibration Equipment used (M&	TE ortical for calibration)		
	TE critical for calibration)	Call Date (Certificate No.)	Subeduted Calibration
himery Standards		Call Date (Certificate No.) 06-Out-10 (No. 217-01266)	Subsoluted Calibration Oct-11
himery Standards lower moter EPM-442A	ID *		
rimery Standards Tower moter EPM-642A Tower sensor HP 8481A Inference 20 dB Attenuator	IQ # GBS7480704 UBS7292783 SNL 5086 (20g)	06 Out 10 (No. 217-01266) 06 Out 10 (No. 217-01266) 30 Mar 10 (No. 217-01156)	Oct-11
himery Standards Yower moter EPM-642A Tower sensor HP 8481A Telerence 20 dB Attenuator Type N mismatch combination	ID # GB37480704 UB37292760 SN: 5086 (20g) SN: 5047.2 / 06327	06 Oct-10 (No. 217-01266) 06 Oct-10 (No. 217-01266) 30 Mar-10 (No. 217-01166) 30 Mar-10 (No. 217-01162)	Oct-11 Oct-11
himery Standards Tower moter EPM-622A Tower sensor HE 9481A Neterone 20 dB Attenuator Type N recently to comprisation feference Probe ES30V3	ID # GB37480704 UB37290760 SN: 5086 (20)) SN: 5047.2 / 06327 SN: 3005	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01156) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3206, Apr-10)	Oct-11 Oct-11 Mar-11
himery Standards Tower moter EPM-622A Tower sensor HE 9481A Neterone 20 dB Attenuator Type N recently to comprisation feference Probe ES30V3	ID # GB37480704 UB37292760 SN: 5086 (20g) SN: 5047.2 / 06327	06 Oct-10 (No. 217-01266) 06 Oct-10 (No. 217-01266) 30 Mar-10 (No. 217-01166) 30 Mar-10 (No. 217-01162)	Oct-11 Oct-11 Mar-11 Mar-14
himery Standards Tower moter EPM-642A Tower sensor HP 6481A helenence 20 dB Attenuator type-M mismatch combination helenence Probe ES3DV3 3AE4	ID # GB37480704 UB37290760 SN: 5086 (20)) SN: 5047.2 / 06327 SN: 3005	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01156) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3206, Apr-10)	O(5-11 O(1-11 Mar-11 Mar-11 Apr-11
Primery Standards Power moter EPM-642A Power sensor HP 6481A Reference 20 46 Attenuator Type N resempts combination Reference Protee ESSOV3 DAEA Secondary Standards	ID # G837480704 US37290790 SN: 5085 (20)) SN: 5047 2 / 06027 SN: 5005 SN: 601	06 Out-10 (No. 217-01266) 06 Out-10 (No. 217-01266) 30 Mar-10 (No. 217-01156) 30 Mar-10 (No. 217-01162) 30 Apr-10 (No. ESS-3005, Apr-10) 10-Jun-10 (No. DAE4-601, Jun10)	Ost-11 Ost-11 Mar-11 Mar-11 Apr-11 Jun-11
himery Standards Fower moter EPM-642A Fower sensor HP 8481A Feference 20 dS Attenuator Type N mismatch combination feference Prote ESSOV3 JAEJ4 Jecondary Standards Fower sensor HP 8481A	ID # G837480704 U637292783 SN: 5086 (20g) SN: 5047_2 / 36327 SN: 3005 SN: 601	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01156) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3265, Apr-10) 10-Aun-10 (No. DAE4-601_Aun10) Check Oute (in house)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check
Primary Standards Power moter EPM-042A Power sensor HP 8481A Reference 20 dB Attenuator Type A mismatch combination Reference Probe ES3CV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator RES SMT-06	ID # GB37480704 UB37290793 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3005 SN: 608	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01166) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3205, Apr-10) 10-Jun-10 (No. OAE4-601, Jun10) Check Oate (in house check Out-06)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11
Primary Standards Power moter EPM-042A Power sensor HP 8481A Reference 20 dB Attenuator Type N mismatch combination Reference Probe ES3CV3 DAE4 Secondary Standards Power sansor HP 8481A RF generator R&S SMT-06	ID # GB37480794 UB37290793 SN: 5086 (20g) SN: 5047_2 / 040327 SN: 3005 SN: 601 ID # MY41090317 100005	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01162) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ESS-3225, Apr-10) 10-Jun-10 (No. DAE4-601, Jun10) Check Outer (in house) 18-Out-02 (in house check Out-09) 4-Aug-99 (in house check Out-09)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In Nouse check: Oct-11 In house check: Oct-11
Primery Standards Power moter EPM-042A Power sensor HP 8481A Perference 20 65 Attenuator Sype M misemple ES30V3 DAE4 Secondary Standards Power sensor HP 8481A RP generator R&S SMT-06 Network Analyzer HP 8750E	ID # OB37480704 US37290790 SN: 5060 (20g) SN: 50705 SN: 5005 SN: 600 ID # MY41092317 100005 US37290085 S4206 Name Demos Bey	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01156) 30-Mar-10 (No. 217-01156) 30-Mar-10 (No. ES3-3026, April0) 10-Jun-10 (No. DAE4-601, Jun10) Check Date (in house) 18-Out-01 (in house check Out-09) 18-Out-01 (in house check Out-09) 18-Out-01 (in house check Out-10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In Nouse check: Oct-11 In house check: Oct-11
Calibration Elpoigement used (MS Primery Standards Primery Standards Primer moter EPM-642A Primer moter EPM-642A Primer sensor HP 6481A Primer sensor HP 6481A Primer sensor HP 6481A RP generator HP 6481A RP generator HP 6733E Calibrated by:	ID # OB37480704 US37290790 SN: 5060 (20g) SN: 50705 SN: 5005 SN: 600 ID # MY41092317 100005 US37290085 S4206 Name Demos Bey	06-Out-10 (No. 217-01266) 06-Out-10 (No. 217-01266) 30-Mar-10 (No. 217-01166) 30-Mar-10 (No. 217-01166) 30-Apr-10 (No. ESS-3206, Apr-10) 10-Aun-10 (No. DAE4-601 "Aun10) Check Oute (in house) 18-Out-02 (in house check Out-06) 18-Out-01 (in house check Out-06) 18-Out-01 (in house check Out-10)	Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In Nouse check: Oct-11 In house check: Oct-11

Certificate No: D1900V2-545_Jan11

Page 1 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

89(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner Engineering AG Zeughaustresse 53, 8004 Zurich, Switzerland





S Schweizerischer Kellbrierdienst Service suisse d'étalennage Servicie svizzers di tanatura S Swiss Calibration Service

Accreditation No.: SCS 108

According by the Swiss Accordington 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 N/A sensitivity in TSL / NORM x,y,z

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
- EC 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	91	900N	1204	545,	Jani
-------------	----	----	------	------	------	------

Page 2 of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page **90(119)**

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

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 VS.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 ² (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR normalized	normalized to TW	40.8 mW / g
SAR for nominal Head TSL parameters	normalized to TW	49.0 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
SAR for nominal Head TSL parameters	normalized to TW	20.8 mW/g ± 16.5 % (k=2)

Certificate No: D1900V2:545_Jan11

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **91(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 \(\Omega + 1.8 \) \(\Omega \)
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: 01900V2-545_Jan11

Page 4 of 6



92(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

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; $\sigma = 1.43 \text{ mho/m}$; $\varepsilon_t = 38.6$; $\rho = 1000 \text{ kg/m}^3$

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

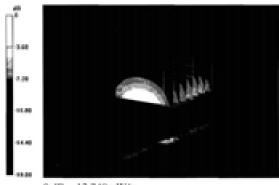
grid: dx=5mm, dy=5mm, dz=5mm

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

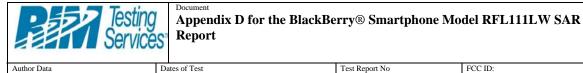
Maximum value of SAR (measured) = 12.743 mW/g



0 dB = 12.740 mW/g

Certificate No: D1900V2-545_Jan11

Page 5-of 6

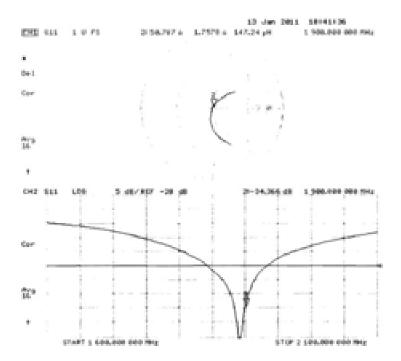


Page **93(119)**

 Author Data
 Dates of Test
 Test Report No
 FCC ID:
 IC

 Andrew Becker
 Nov 22 2012 – Feb 28 2013
 RTS-6026-1302-13
 L6ARFL110LW
 2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545_Jan11

Plage 6 of 6



94(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID:

L6ARFL110LW

2503A-RFL110LW

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





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

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1900V2-545_Jan13

ALIBRATION	ERTIFICATE	And the state of the state of the	
Riject	D1900V2 - SN: 5	45 17 10 10 10 10 10 10 10 10 10	
althration procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	we 700 MHz
Calibration date:	January 09, 2013	glodacy disc.	
The measurements and the unco	dainties with confidence p	onal standards, which realize the physical un robability are given on the following pages an y facility: environment temperature (22 s 3/1/	d are part of the certificate.
albration Equipment used (M&	TE critical for calibration)		
Yimany Standards	10 4	Call Date (Certificate No.)	Scheduled Calibration
The second second second	G807480794	01-Nov-12 (No. 217-01640)	
Ower maker EPM-44CA	Substitute Printers Service	ALCOHOL: 19 SAME WAS ASSAULTED.	Ott:43
	US97290763	01-Nov-12 (No. 217-01640)	Oct 13 Oct 13
ower sensor HP 8401A			
gerer sensor HIP 8401.A eference 20-dB Attenuator	US97290703	01-Nov-12 (No. 217-01640)	Oct-13
ower sensor HP 8401A eference 20 dB Attenuator spe N mismatch combination	US87290763 SN: 5058 (70k)	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0805, Dec12)	Gen-13 Apr-13
ower sensor HP 8401A eference 20 dB Attenuator ope N mismatch combination leference Probe ESSCW3	USS7290703 SN: 5058 (70k) SN: 5047.3 / 00307	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530)	Oes-13 Apr-13 Apr-13
peer sensor HP 8481A eference 30 dB Attenuator goe N mismatch combination aforence Probe ESSOV3 AE4	USS7290703 SN: 5058 (704) SN: 5647.3 / 06307 SN: 3006	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0805, Dec12)	Oct 13 Apr 13 Apr 13 Dec 13
ower sensor HP 8461A leference 20 dB Attenuator ppe N mismatch contrivation leference Probe ESCOV3 AEI4 econdary Standards	US37292763 SN: 5056 (704) SN: 5647.3 / 06327 SN: 3096 SN: 601	91-Rov-12 (No. 217-91640) 27-Mar-12 (No. 217-91630) 27-Mar-12 (No. 217-91630) 28-Dec-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12)	Oct 13 Apr 13 Apr 13 Dec 13 Jun 13
Coner sensor HSP 8481.A telerence 20: dB Attenuator type N mismatch combination telerence Probe ESSONS MAE4 Accordary Standards Ower sensor HSP 8481.A	US3/290763 SN: 5058 (70k) SN: 5047.3/100307 SN: 5047.3/100307 SN: 601	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date-(in house)	Oct 13 Apr 13 Apr 13 Dec 13 Jun-13 Schoolsled Check
Contraction of 16° 8481A Informace 20° dB Attenuator yee N mismatch combination Informace Probe ESCOVS IAE/4 Incompany Standards Contraction of 16° 8481A 8° generator R&S SMT 06	US3/290763 SN: 5056 (70k) SN: 5047.3/100327 SN: 3056 SN: 601 ID # MY4/1092317	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Dec-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date (in house check Oct-11)	Oct 13 Apr 13 Apr 13 Disc 13 Jun-13 Schedulad Check In house check; Oct-13
Contraction of 16° 8481A Informace 20° dB Attenuator yee N mismatch combination Informace Probe ESCOVS IAE/4 Incompany Standards Contraction of 16° 8481A 8° generator R&S SMT 06	USX7290763 SN: 5656 (704) SN: 5647.3/166327 SN: 5647.3/166327 SN: 601 ID # MY41090317 100005	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date-(in house) 18-Out-02 (in house check Out-11) 01-Aug-09 (in house check Out-12) 18-Out-01 (in house check Out-12)	Oct 13 Apr 13 Apr 13 Dec 13 Jun 13 Schecklast Check In house check: Oct 13 In house check: Oct 13
Coner sensor HP 8481A televence 20-dB Attenuator ype N mismatch combination televence Probe ESCOV3 IAE/4 lecondary Standards Coxer sensor HP 8481A 6F garressor RES SMT 06 lebeots Analyzor HP 8753E	US37290793 SN: 5058 (704) SN: 5047.3 / 00327 SN: 5047.3 / 00327 SN: 601 ID # MY47090597 10037390689 64208	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0305, Dec12) 27-Jun-12 (No. EA64-601, Jun12) Check Date (in house check Cot-11) 04-Aug-09 (in house check Cot-11) 18-Out-01 (in house check Cot-12)	Oes 13 Apr 13 Apr 13 Dec 13 Jan 13 Scheduled Check In house check: Oct 13 In house check: Oct 13 In house check: Oct 13
Types remore HP 8481A Inference 20 dB Attenuator type N informatch combination Inference Probe ESCOVS MAEA Incombing Standards Tower sensor HP 8481A IF generator RES SMT 06 interest. Analyzor HP 8753E	USX7290763 SN: 5056 (70k) SN: 5047.3/100327 SN: 3056 SN: 601 ID # MY41092317 100005 USX7390665 54206 Name Israe El-Neouq	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-0205, Dec12) 27-Jun-12 (No. DAE4-601, Jun12) Check Date-(in house) 18-Out-02 (in house check Out-11) 01-Aug-09 (in house check Out-12) 18-Out-01 (in house check Out-12)	Oes 13 Apr 13 Apr 13 Dec 13 Jan 13 Scheduled Check In house check: Oct 13 In house check: Oct 13 In house check: Oct 13
Power meter EPM-442A Power sensor 19° 8481A Power sensor 19° 8481A Reference 20 dB Abendantor (spe N microatch combination Industrial Probe ESSONS IALI4 Reconstary Standants Power sensor 19° 6481A RF generator 988 SATI 06 Rebook Analyzor 19° 8753E Calibrated by:	US37290763 SN: 5656 (204) SN: 5647.3/166327 SN: 601 SN: 601	01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01630) 28-Osc-12 (No. ESS-0305, Dec12) 28-Osc-12 (No. EAE-4601, Jun12) Check Eate-(in house check Con-11) 58-Osc-02 (in house check Con-11) 58-Osc-01 (in house check Con-12) Function Laboratory Technician	Oct 13 Apr 13 Apr 13 Dec 13 Jan 13 Scheduled Check In house check: Oct 13 In house check: Oct 13 In house check: Oct 13

Certificate No: D1900V2-545_Jan13

Page 1 of 6



95(119)

Author Data Andrew Becker Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Calibration Laboratory of

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





Schweigerischer Kalibrierdienst 8 Service suisse d'étalonnage C

Servizio evissero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Senice (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
- 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
- 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.

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%.

Certificate No: D1900V2-545_Jan13

Page 2 of 6



96(119)

Author Data **Andrew Becker** Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASY5	V52.0.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSt.	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz a 1 MHz	

Head TSL parameters

The follow

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.4 ± 6 %	1.38 mholm ± 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	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to TW	40.2 W/kg x 17.0 % (k×2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.26 W/kg
SAR for nominal Head TSL parameters	normalized to TW	21.1 W/kg = 16.5 % (k=2)

Certificate No: D1900V2-645_Jan13

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page **97(119)**

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID:

L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.0 Ω = 1.7 JΩ
Pleturn Loss	- 34.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 ms
----------------------------------	----------

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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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: D1900V2-645_Jan13

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

98(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date: 09.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: \$45

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; $\sigma = 1.38$ S/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

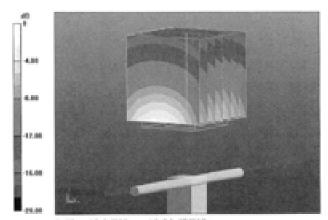
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.98, 4.98, 4.98); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012.
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

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

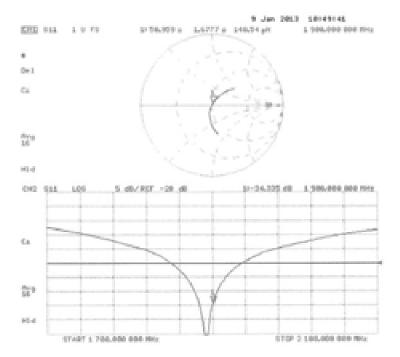
Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 95.493 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 18.1 W/kg SAR(1 g) = 10 W/kg; SAR(10 g) = 5.26 W/kg Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dBW/kg



Impedance Measurement Plot for Head TSL



Contilicate No: D1900V2-S45_Jan13 Page 6 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

100(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeoghaustrass 13, 8001 Zerlot, Switzerland





Schweizerlacher Kelfbrierdienst Servizie suisse d'étalonnage Servizio svizzero di tavatura Sersa Caribration Service

Accretised by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the alignatories to the EA
Multilizinal Agreement for the recognition of calibration certificates

Client RTS (RIM Teeting Services)

Curtifices No. D1900V2-5d075_Apr11

Insued April 8, 2011

Accreditation No.: SCS 108

CALIBRATION CERTIFICATE

Chines

D1900V2 - SN: 5d075

Calibration procedure(s)

QA CAL-05.v8

Calibration procedure for dipole validation kits

Carbration date:

April 5, 2011

This collibertion conflices documents the inspectfully to national standards, which realize the physical units of measurements (S).

The measurements and the uncertainties with confidence probability are given on the informing pages and the part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (52 a 5)°C and humidity < 70%.

Calibration Equipment used (METE critical for pathroport)

Primary Standards	0.4	Cal Date (Certificate No.)	Scheduled Calibration
Power maler EPM 4424	GDD7480F64	96-Oct-15 (No. 217-01286)	Oct-11
Power sensor HP \$461A	US07290780	98-Oct-10 (No. 217-01286)	Om-11
Poliprehoe 20:59 Athehyator	SN: 5084 (20g)	29 Mar 11 (No. 217 01568)	Apr-12
Typie Ni minimaton portitination	SM: 5047.2 / 05027	29-Mar-11 (No. 217-01271)	April 12
Polymento Probe E500V3	SN: 0005	30-Apr-16 (No. ES3-3205, Apr15)	Apr-11
DAE4	594, 601	10-Jun-10 (No. DAG4-601_Jun H)	Jun-11
Secondary Standards	10.4	Check Date (in house)	Scheduled Check
Power sensor HP entra	M161002317	18-Oct-02 (in house check Oct-09)	in house sheck: Oct-11
RF-generator RAS SMT-00	100005	4-Aug 99 (in house sheek Oct-99)	in house sheek, Oct-11
Network Analyzer HP 8753E	US37390585 54896	18-Oct-01 (in house check Oct-10)	In house check: Oci-11
	Name	Punction	Signature
Calibrated by:	Milita Madi	Laboratory Technicien	Threei
Approved by:	Keda Potento	Taulintes Manager	00 40

Certificate No: D1900VQ-5d075_Apr11

Page 1 of 6

This calibration certificate shall not be reproduced supopt in full without written approval of the laboratory.



Page **101(119)**

Author Data
Andrew Becker

Dates of Test Nov 22 2012 – Feb 28 2013 Test Report No RTS-6026-1302-13 FCC ID:

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner

Engineering AG Zeograssesses 43, 8004 Zurich, Switzerland NOC-NEA



S Schweizerlacher Keilbrierdienst Service suisse d'étalennage Servigie existere di teretura S Swise Culibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Appredication Service is one of the signaturies to the EA. Multileteral Agreement for the recognition of calibration certificates

Glossary:

TSL ConvF N/A tissue simulating liquid

sensitivity in TSL / NORM x,y,z 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
- EC 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 Na: 01900V2-5d075_Apr11	Page 2 of 6	



Appendix D for the BlackBerry ${\bf @}$ Smartphone Model RFL111LW SAR Report

Page 102(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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 perameters	22.0 °G	40:0	1,40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.41 mholm ± 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 eW / g
\$AR normalized	normalized to TW	40.8 mW / g
SAR for nominal Head TSL parameters	normalized to TW	40.4 mW/g ± 17.0 % (k=2)

SAFI averaged over 10 cm ² (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.29 WW / g
SAR normalized	normalized to 1W	21.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	21.0 mW/g a 16.5 % (k-2)

Certificate No: D1900V2-5d075_April 1

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

103(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 - Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5 Ω + 6.1 jΩ
Return Loss	-23.3 66

General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns

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

The dipole is made of standard semirigid ossalial 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	January 24, 2005

Certificate No: D1900V2-50075_Apr11

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

104(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 - Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

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: 1909 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: f = 1900 MHz; $\sigma = 1.41 \text{ mbo/m}$; $\epsilon_c = 39$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007).

DASY5 Configuration:

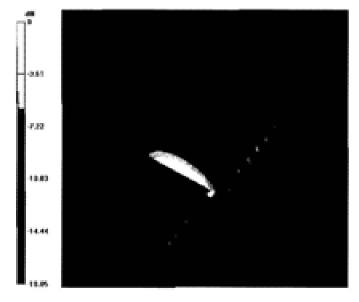
- Probe: ES3DV3 SN3205; ConvES309, 5.09, 5.09 r. Culbrated. 30.04.2010
- Sensor-Surface: Jenn (Mochanical Surface Detection)
- Electronics: DABI Sn601; Calibrated: 10.06.2010
- Phanton: Pht Phanton 5.0 (Stort); Type: QD000P56AA; Serial: 1001
- Monumement SW: DASY52, V\$2.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2)(29)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 97.376 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 18.796 W/kg

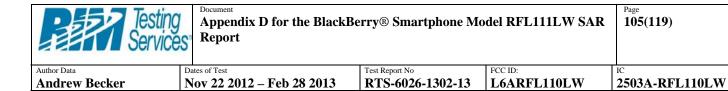
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.29 mW/gMaximum value of SAR (measured) = 12.476 mW/g



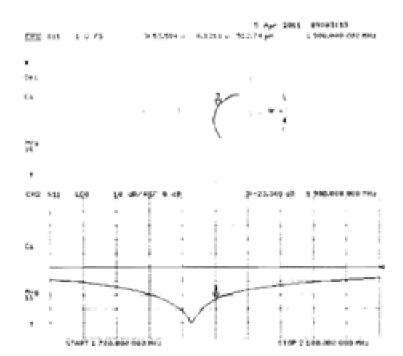
 $0.48 \times 12.490 \text{m/W/y}$

Certificate No: D1900V2 5d075_Apr11

Page 5-of 6



Impedance Measurement Plot for Head TSL



Certificate No. 01900V2-56075_Apr11 Page 6 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

106(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID: L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeophoustrasse 43, 8004 Zurloh, Switzerland





S Schweizerischer Kallbrierdienst C Service suisse d'étalonnage Servizio suizzero di teratura S Swiss Calibration Service

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

Citizent

RTS (RIM Testing Services)

Controlle No: D2450V2-747_NoV11

Accreditation No.: SCS 108

			随时间代,经时 产32周二次
Speci	02450V2 - SN: 7	87 St. St. 300 St. 300 St.	Marin Company
Salibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	November 09, 20		(8585) 1855 HPS
		ional standards, which resilize the physical un robability are given on the following pages an	
All calibrations have been conduc	ded in the closed laborator	ry facility: environment temperature (22 x 3)/1	C and humidity < 70%.
	THE ADDRESS HAVE AND REAL PROPERTY.		
Calibration Equipment used (MIL)	TE ordinal for calibrations		
	ID #	Car Date (Certificate No.)	Scheduled Celibration
Primary Standards		Cel Date (Certificate No.) 05-0ct-11 (No. 217-01451)	Scheduled Calibration Oct-12
Primary Standards Power meter EPM-442A	01		
Primary Standards Power mater EPM-44EA Power sensor HP 8481A	ID # G832480704	05-Oct-11 (No. 217-01451)	Oct-12
Primary Standards Power matter EPM-44EA Power sensor HP 8481A Reference 20-d8 Attenuator	ID # GB3749GF04 US37292793	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	Oct-12 Oct-12
Primary Standards Power matter EPM-4402A Power sensor HIP 8481A Reference 20-dB Attenuator Type-Ni mismatch combination	ID # G897480704 US37292793 SN: 5086 (20g)	05-Oct-11 (No. 217-01457) 05-Oct-11 (No. 217-01457) 29-Mar-11 (No. 217-01368)	Oct-12 Oct-12 Apr-12
Primary Standards Power meter EPM-442A Power semsor HP 8461A Reference 20-65 Attenuator Type-N mematch combination Reference Probe ES307/3	ID # G887486704 US37292785 SA: 5086 (30g) SA: 5047.2 / 06827	05-Oct-11 (No. 217-01407) 05-Oct-11 (No. 217-01407) 29-Mar-11 (No. 217-01308) 29-Mar-11 (No. 217-01371)	Oct-12 Oct-12 Apr-12 Apr-12
Primary Standards Power meter EPM-44EA Power sensor HP 64E1A Reference 20:dB Attenuator Type N mismatch combination Reference Probe ESSOV3 DAE4	ID # G857480704 US37292795 S4: 5086 (30g) S4: 5047.2 / 06327 S4: 3205	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. 253-0265, Apr-11)	Oct-12 Oct-12 Age-12 Age-12 Age-12
Primary Standards Power meter EPM-44EA Power sensor HP 6461A Reference 20-55 Attenuator Type N invention combination Reference Probe ES30V3 DAC4 Secondary Standards	ID # G857480704 US37292785 SN: 5086 (30g) SN: 5047.2 / 06527 SN: 3295 SN: 601	05-Dot-11 (No. 217-01401) 05-Dot-11 (No. 217-01401) 29-Mar-11 (No. 217-0130) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 053-0205, Apr-11) 04-Jul-11 (No. DAS4-001_Jul-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Apr-12 JAF-12
Primary Standards Power meter EPM-44DA Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ESSOVI) DAEA Secondary Standards Power sensor HP 8481A	ID # GBS7486704 US37292785 SN: 5086 (R0g) SN: 5047.2 / 06527 SN: 3265 SN: 601	05-Dot-11 (No. 217-01407) 05-Dot-11 (No. 217-01407) 29-Mar-11 (No. 217-01300) 29-Mar-11 (No. 217-0137) 29-Apr-11 (No. 050-0205, Apr-11) 04-Jul-11 (No. DAD4-601_Jul-11) Check Date (in house)	Oct-12 Oct-12 Age-12 Age-12 Age-12 Jul-12 Scheduled Check
Primary Standards Power meter EPM-44DA Power sensor HP 84B1A Reference 20-55 Attanuator Type-N mismatch combination Reference Probe ES30V3 DAE4 Secondary Standards Power sensor HP 84B1A RF generator RBS SMT-06	D # G857496704 US37296795 SN: 5046 (80g) SN: 5047.2 / 06527 SN: 3965 SN: 601	05-Dol-11 (No. 217-01407) 05-Dol-11 (No. 217-01407) 29-Mar-11 (No. 217-01300) 29-Mar-11 (No. 217-0137) 29-Apr-11 (No. 050-3205, Apr-11) 06-Jul-11 (No. DAE-401_Jul-11) Check Date (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13
Calibration Elgalpment used (MET) Primary Standards Prower matter EPM-44EA Prower sensor HP 8481A. Reference 20-59 Attenuator Type-1 mismatch combination Reference Probe ESSOV3 CAE4 Secondary Standards Prower sensor HP 84E1A. RF generator R&S SMT-06 Natwork Analysis HP 8750E	(D # G987490704 US37292793 SN: 5086 (Dg) SN: 5047.2 / 06827 SN: 3095 SN: 601 ID # MY41080317 100005 US37390595 S4206	05-Dc5-tri (No. 217-01467) 05-Dc5-tri (No. 217-01467) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 550-0205, Apr11) 04-Jul-11 (No. DAE4-601, Jul-11) Check Date (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Apr-12 Jal-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
Primary Standards Power meter EPM-44DA Power sensor HP 84B1A Reference 20-55 Attenuator Type-N mismatch combination Reference Probe ES30V3 DAE4 Secondary Standards Power sensor HP 84B1A RF generator RBS SMT-06	ID # G9857490704 US37290799 SA: 5008 (00g) SA: 5047.2 / 06327 SA: 5019 SA: 601 ID # MY41090317 100005 US37390586 \$4206	05-Oct-11 (No. 217-01407) 05-Oct-11 (No. 217-01401) 29-Mar-11 (No. 217-01308) 29-Mar-11 (No. 217-01301) 29-Apr-11 (No. 553-3205, Apr-11) 04-Jul-11 (No. DAS4-601, Jul-11) Check State (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)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Apr-12 Jal-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
Primary Standards Power meter EPM-44EA Power sensor HP 64E1A Reference 20-55 Attenuator Type N instance combination Reference Probe ESSOVIS GAE4 Secondary Standards Power sensor HP 64E1A RF generator R&S SMT-06 Network Analyses HP 67ESE	(D # G987490704 US37292793 SN: 5086 (Dg) SN: 5047.2 / 06827 SN: 3095 SN: 601 ID # MY41080317 100005 US37390595 S4206	05-Dc5-tri (No. 217-01467) 05-Dc5-tri (No. 217-01467) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 550-0205, Apr11) 04-Jul-11 (No. DAE4-601, Jul-11) Check Date (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Apr-12 Jal-12 Scheduled Check In house check: Oct-13 In house check: Oct-13

Certificate No: D2450V2-747_Nov11

Page 1 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page

107(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No RTS-6026-1302-13 FCC ID:

L6ARFL110LW

2503A-RFL110LW

Calibration Laboratory of

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





S Schweizerischer Kallbriendlenst C Service sulsse d'étalonnage 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 / NOR

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
- EC 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

Page 2 of 6



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page

108(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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 n 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 a 6 %
Head TSL temperature change during test	< 0.5 °C	_	

SAR result with Head TSL

SAR averaged over 1 cm ² (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 a 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: DQ450V2-747_Nov11

Page 3 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

109(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 \O + 1.3 \O
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 cossial 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 DG-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 01, 2003

Certificate No. D2450V2-747_Nov11

Page 4 of 6



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page 110(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

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; $\sigma = 1.84 \text{ mho/m}$; $\varepsilon_e = 37.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

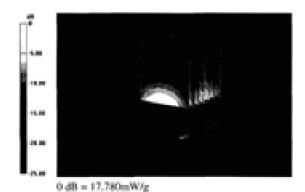
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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:

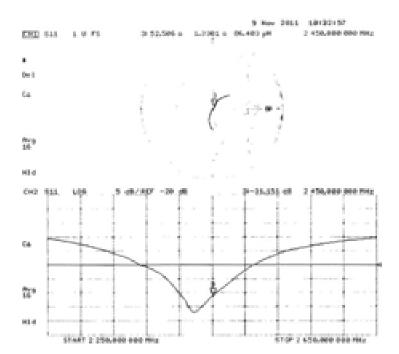
Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 102.1 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 28.853 W/kg SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.39 mW/g Maximum value of SAR (measured) = 17.782 mW/g



Certificate No: D2450V2-747_Nov11



Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-747_Nov11

Page 6 of 6



112(119)

Author Data **Andrew Becker** Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

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





Schweizerischer Kallbriendienst Service suisse d'étalonnage C Servizio svizzero di taratura Sarius Calibration Service

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

RTS (RIM Testing Services)

Contribute No: DSGHzV2-1033_Nov11

Accreditation No.: SCS 108

	ERTIFICATE	Line and the	AND THE PARTY OF T
Diject	DSGHzV2 - SN:	1000	AND THE PROPERTY OF THE PERSON
Calibration procedure(s)	GA CAL-22.v1 Calibration proce	dure for dinnie velidation kits her	ween 3-6 GHz
Calibration date:		Market State of the State of th	
		onal standards, which realize the physical un robubility are given on the following pages an	
All calibrations have been conduc	ted in the closed laborator	y facility: environment temperature (22 x 3)*C	C and humidity < 70%.
Celibration Equipment used (MS)	E official for calibrations		
Yimay Standards	0.	Call Date (Certificate No.)	Scheduled Calibration
Yimay Standards		Call Date (Cartificate No.) 05-Qct-11 (No. 217-01457)	Scheduled Calibration Oct-12
Yimary Standards Youer meter EPM-442A	0.		
*Ymary Standards *Ywer meter EPM-442A *Ywer sensor HP 8481A	ID # G837480704	05-Oct-11 (No. 217-01451)	On-12
Primary Standards Power meter EPM-642A Power sensor HP 8481A Reference 20 dB Attenuator	ID # G837480704 U637290783	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	Oct 12
Primary Standards Power motor EPM-642A Power sensor HIP 8481A Reference 22 dB Attenuator Type N mismatch combination	ID # G637460704 U537290763 SR: 5066 (20g)	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01568)	Oct-12 Oct-12 Apr-12
Primary Standards Power moter EPM-642A Power better 19 8481A Antonine 20 dB Antoniator Type N instruction comprises Antonine Probe EXSCV4	ID # G837480794 U837290783 SN: 5086 (20g) SN: 5047.2 / 08327	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-0136) 29-Mar-11 (No. 217-01371)	Oci 12 Oci 12 Apr 12 Apr 12
Primary Standards Power moter EPM-142A Power sensor HP 8481A Reference 20 48 Attenuator Type-N mismatch combination Nafarance-Probe EXSOV4 DAE4	ID # G807480704 U837390748 SN: 5006 (20g) SN: 5047.2/100327 SN: 3608	05-Oci-11 (No. 217-01451) 05-Oci-11 (No. 217-01451) 29-Mar-11 (No. 217-01068) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-0500_Mar-11)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12
Primary Standards Power meter EPM-642A Power sensor HP 8481A Reference 20 48 Attenuator Type N mismatch combination Reference Probe EXSOV4 DAEA Secondary Standards	ID + GBS7480704 US372907983 SRI 5047.2 / 06327 SRI 3623 SRI 601	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01058) 29-Mar-11 (No. 217-01051) 04-Mar-11 (No. EXS-0500, Mar-11) 04-Jul-11 (No. EXS-0500, Jul-11)	Oct-12 Oct-12 Age-12 Age-12 Mar-12 Jul-12
Primary Standards Power moter EPM-642A Power sensor HP 8481A Reference 20 dB Attenuator Type N internation Oralization Reference Probe EXSOV4 DAE4 Secondary Standards Power sensor HP 8481A	ID # G857480704 U537290783 SN: 5066 G093 SN: 5047.2 / 06327 SN: 3603 SN: 601	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. EX3-3500_Mar-11) 04-Jul-11 (No. EX6-401_Jul-11) Check Cate (in house)	Oct-12 Oct-12 Agn-12 Agn-12 Mar-12 Jul-12 Scheduled Check
Primary Standards Power moter EPM-642A Power sensor HP 8481A Pelenence 20 46 Attenuator Type-N mismatch combination Reference Probe EXSDV4 DAE4 Secondary Standards Primer sensor HP 8481A RF generator R&S 8481-06	ID # GBS7460704 UB37262783 SN: 5086 (20g) SN: 5067 2 / 06027 SN: 3608 SN: 601 ID # MY41092317	85-Oct 11 (No. 217-01451) 95-Oct 11 (No. 217-01451) 29-Mar-11 (No. 217-01958) 29-Mar-11 (No. 217-01371) 94-Mar-11 (No. EXS-3500_Mar-11) 94-Jul-11 (No. EXS-4601_Jul-11) Otto(A Cate (in house) 18-Oct 02 (in house)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12 Jul-12 Schecklad Check In house check: Oct-13
Primary Standards Power meter EPM-042A Primar sensor HP 8481A Perference 20 dB Attenuator Type N mismatch combination Perference Probe EXICOVI DAEA Secondary Standards Primar sensor HP 8481A PF generator R&S 8471-06 Network Analyzer HP 87106	ID # G857460704 US37290763 SN: 5060 (20g) SN: 5067.2 / 06027 SN: 3608 SN: 601 ID # MY41090317 10006 US37300665 54206	05-Ocs 11 (No. 217-01451) 05-Ocs 11 (No. 217-01451) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. EXG-3500_Mar-11) 04-Jul-11 (No. EXG-3500_Mar-11) 04-Jul-11 (No. EXG-4601_Jul-11) Oreck Cate (in house) 18-Ocs 02 (in house check Ocs-11) 18-Ocs 01 (in house check Ocs-11) 18-Ocs 01 (in house check Ocs-11)	Oct-12 Oct-12 Agr-12 Agr-12 Mar-12 Jal-12 Scheduled Check In house check Oct-13 In house check Oct-13
Calibration Equipment used (M&I Primary Standards Proser meter EPM-642A Power sensor HP 8481A Reference 20 48 Attenuator Type N mismatch combination Reference Probe EXICOVI DAS4 Secondary Standards Proser sensor HP 8481A RF generator RAS SATT OS Network Analyzer HP 87536 Calibrated by:	ID # GBS7480704 USS7290796 SN 5080 (20) SN 5067 2 / 08027 SN 5608 SN 601 ID # MY41092317 10006 USS7360686 54206	05-Ocs 11 (No. 217-01451) 05-Ocs 11 (No. 217-01451) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. EXG-3500_Mar-11) 04-Jul-11 (No. EXG-3500_Mar-11) 04-Jul-11 (No. EXG-4601_Jul-11) Oreck Cate (in house) 18-Ocs 02 (in house check Ocs-11) 18-Ocs 01 (in house check Ocs-11) 18-Ocs 01 (in house check Ocs-11)	Oct-12 Oct-12 Agr-12 Agr-12 Mar-12 Jal-12 Scheduled Check In house check Oct-13 In house check Oct-13
Primary Standards Power meter EPM-042A Primar sensor HP 8481A Perference 20 dB Attenuator Type N mismatch combination Perference Probe EXICOVI DAEA Secondary Standards Primar sensor HP 8481A PF generator R&S 8471-06 Network Analyzer HP 87106	ID # GBS7490704 USS7290796 SN: 5086 (20) SN: 5067 2 / 06327 SN: 5628 SN: 601 ID # MY41092517 10006 USS7360686 54206 Name Dence Say	05-Och 11 (No. 217-01451) 05-Och 11 (No. 217-01451) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. 217-0156) 29-Mar-11 (No. EXC-3500, Mar-11) 04-Jul-11 (No. EXC-3500, Mar-11) 04-Jul-11 (No. EXC-4601, Jul-11) Official Cate (in house) 18-Och Oz (in house check Och-11) 18-Och Oz (in house check Och-11) 18-Och Oz (in house check Och-11) 18-Och Oz (in house check Och-11) Function	Oct-12 Oct-12 Agr-12 Agr-12 Mar-12 Jal-12 Scheduled Check In house check Oct-13 In house check Oct-13

Certificate No: DSGHzV2-1033_Nov11

Page 1 of 8



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page 113(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

FCC ID:

L6ARFL110LW

2503A-RFL110LW

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





S Schweizerischer Kalibrierdienel
C Service suisse d'étalonnage
Servizio svizzero di tarutura
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
- EC 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.
- 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



Appendix D for the BlackBerry ${\bf @}$ Smartphone Model RFL111LW SAR Report

Page 114(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

Measurement Conditions

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

DASY Version	DASYS	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)	
Frequency	5200 MHz a 1 MHz 5500 MHz a 1 MHz 5800 MHz a 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 mhoim
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 \$200 MHz

SAR averaged over 1 cm2 (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 a 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

the concerning parameters and carconatoris were approxi-				
	Temperature	Permittivity	Conductivity	
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mholm	
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 cm3 (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 x 17.0 % (k=2)

SAR averaged over 10 cm ² (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.50 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.7 mW / g a 16.5 % (k=2)

Certificate No: DSQHgV2-1033_Nov11

Page 3 of 8



Appendix D for the BlackBerry $\hspace{-0.05cm}$ Smartphone Model RFL111LW SAR Report

Page 115(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

FCC ID: L6ARFL110LW

2503A-RFL110LW

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	8.00 mW / g
SAR for nominal Head TSL parameters	normalized to TW	79.4 mW / g = 17.0 % (k=2)

SAR averaged over 10 cm² (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 mW / g
SAR for nominal Head TSL parameters	normalized to TW	22.5 mW/g a 16.5 % (k=2)

Certificate No: D5GHzV2-1033_Nov11



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

Page 116(119)

Author Data
Andrew Becker

Dates of Test

Nov 22 2012 – Feb 28 2013

Test Report No

RTS-6026-1302-13

L6ARFL110LW

FCC ID:

2503A-RFL110LW

Appendix

Antenna Parameters with Head TSL at 5200 MHz

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

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	52.3 Ω - 2.7 jΩ
Return Loss	- 29.2 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	56.7 \(\Omega \cdot 4.3 \)\(\Omega \cdot \Omega \cdot \Om
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

Certificate No: D5GHzV2-1033_Nov11

Page 5 of 8



Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report

age

117(119)

Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

L6ARFL110LW

FCC ID:

2503A-RFL110LW

DASY5 Validation Report for Head TSL

Date: 15.11.2011

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; $\sigma = 4.46$ mho/m; $\varepsilon_r = 34.6$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5500 MHz; $\sigma = 4.75$ mho/m; $\varepsilon_r = 34.2$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5800 MHz; $\sigma = 5.03$ mho/m; $\varepsilon_r = 33.7$; $\rho = 1000$ 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/gMaximum value of SAR (measured) = 19.463 mW/g

Certificate No: DSGHzV2-1033_Nov11

Page 6 of 8



118(119)

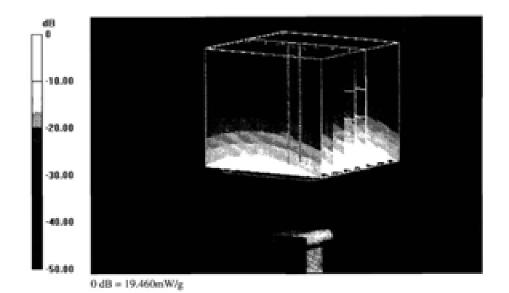
Author Data
Andrew Becker

Dates of Test
Nov 22 2012 – Feb 28 2013

Test Report No **RTS-6026-1302-13**

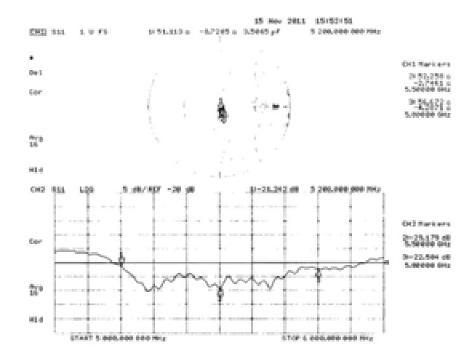
FCC ID: L6ARFL110LW

2503A-RFL110LW



Testing Service	Appendix D for the BlackBerry® Smartphone Model RFL111LW SAR Report			Page 119(119)
Author Data	Dates of Test	Test Report No	FCC ID:	IC
Andrew Becker	Nov 22 2012 – Feb 28 2013	RTS-6026-1302-13	L6ARFL110LW	2503A-RFL110LW

Impedance Measurement Plot for Head TSL



Certificate No: DSGHzV2-1003_Nov11

Page 8 of 8