Testing Services	Appendix D for the Black Report Rev 3	ckBerry® Smartphone Model	RFY111LW SAR	Page <b>1(49)</b>
Author Data	Dates of Test	Test Report No	FCC ID:	IC
Andrew Becker	July 02 –August 15, 2013	RTS-6046-1308-34 Rev 3	L6ARFY110LW	2503A-RFY110LW

## APPENDIX D: PROBE & DIPOLE CALIBRATION DATA



# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Author Data
Andrew Becker

Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW 2503

2503A-RFY110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstresse 42, 8004 Zurich, Switzerland





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Swiss Calibration Service

Accounted by the Swiss Accorditation Service (SAS)

The Swiss Accorditation Service is one of the signatories to the EA Multitateral Agreement for the recognition of satisfaction vertilisates

Client

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Cortificate No: ES3-3225\_Jan13

# CALIBRATION CERTIFICATE Object ES3DV3 - SN:3225 Calibration procedure(s) QA CAL-01.V8, QA CAL-23.V4, QA CAL-25.V4 Calibration procedure for dosimetric E-field probes Calibration state: January 10, 2013: This calibration certificate documents the traceability to rational standards, which realize the physical units of measurements (51) The measurements and the uncertainties with confidence protection; are given an tibe fallowing pages and are part of the curridicate. All calibrations have been consucted in the closed apporatory facility environment temperature (22.4.3)°C and hymothy > 70%. Calibration Equipment used (M&TE critical for calibration)

Printery Standards	10	Cal Date (Certificate No.)	Scheduled Calibration
Power motor E4419B	GB41293874	29-Mar-12 (No. 217-01609)	Apr-13
Fower sameor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	April 3
Reference 3 dll Attenueror	SM: \$5054 (3c)	27-Mar-12 (No. 217-01531)	Apr. 13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01829)	Apr 13
Reference 30 dB Attenuator	SN: 85129 (30b)	27 Mar. 12 (No. 217-01532)	Apr-13
Reference Proise ES3DV2	SN: 3013	28 Dec 12 (No. E83-3013 Dec12)	Dec-13
DAE4	BN: 660	25-Jun-12 (No. DAE4-668, Jun 12)	Jun-15
Secondary Standards	10	Check Date (in house)	Behaduled Christs
RE generator HP 6640C	US3642xI01700	4-Aug-99 (in house check Apr-11)	In house check: Apr 13
Network Analyzer HP 87536	LIB37200588	18 Out 61 (in human sheek Out-12)	by france shock, Oct 13

	Name	Function	Signature
Californial by	Jennes Kantrati	Laboratory Technician	F-U-
Approved by:	Kasa Pokevac	Technical Manager	Sitty-
			Issued: January 14, 2013

Certificate No. ES3-3225\_Jan13

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Author Data Andrew Becker Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

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





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Schweizerischer Kalibrierdienst S Service suruse d'étalannag C

Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108.

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

Glossary:

NORMx.y.z ConvF

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

DCP CF crest factor (1/duty\_cycle) of the RF signal A, B, C, D modulation dependent linearization parameters

Potanzation is y rotation around probe axis

Polarization # 8 rotation around an axis that is in the plane normal to probe axis (at measurement center),

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

#### Calibration is Performed According to the Following Standards:

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

#### Methods Applied and Interpretation of Parameters:

- NORMx.v.z: Assessed for E-field polarization 3 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values; i.e., the uncertainties of NORMx,y,z does not affect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z \* frequency\_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included. in the stated uncertainty of ConvF.
- DCPx.v.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 date 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 phentom using E-field (or Temperature Transfer Standard for f ± 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100
- Spherical isotropy (3D deviation from isotropy); in a field of law 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 exis). No tolerance required.

Certificate No ES3-3225\_Jan13

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Author Data
Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID: L6ARFY110LW

2503A-RFY110LW

E530V3 - 5N:3225

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\_Jen13

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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

E83DV3- SN:3225

January 10, 2013

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

#### Basic Calibration Parameters

NAMES TO A STREET OF THE STREE	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) <sup>2</sup> ) <sup>A</sup>	1.29	1.19	1.31	± 10.1 %
DCP (n/V) <sup>6</sup>	100.5	101.5	99.9	

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√gV	C	D dB	VR mV	Unc* (k=2)
D	CW	1X	0.0	0.0	1.0	0.00	187.5	±2.7 %
		Y	0.0	: 0.0	1.0		158.4	
		2	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. E53-3225 Jan 13

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<sup>\*</sup> The unsertainties of NormX,Y,Z du soil affect the E\* held uncertainty makin TSL (see Pages 5 and 0).

Numerical invarigation parameter: uncertainty not required.

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



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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

ES3DV3-SN:3226

January 10, 2013

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

#### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity*	Conductivity (S/m)	ConvF X	Canv# Y	ConvF Z	Alpha	Dopth (mm)	Unct. (k=2)
750	41.9	0.89	6.86	8.56	8.58	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	± 12.0 %
2450	39.2	1.80	4.66	4.65	4.65	0.61	1.63	± 12.0 %
2600	39.0	1.98	4.43	4.43	4.43	0.80	1.32	± 12.0 %

Certificate No. ES3-3225\_Jun13

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E Prequency validity of ± 100 MHz only applies for DASY v4.4 anni higher (see Page 2), rise it in restricted to ± 50 kHz. The uncertainty is the RSS of the ConvP ancertainty at existence frequency and the uncertainty for the indicated frequency bond.

All requencies below 3 GHz, the validity of tissue parameters (a and iii) and to revise the + 10% if liquid companies hismake is apprect to measured SAR values. A frequency above 3 GHz, the validity of tissue peremeters (a and iii) is restricted to ± 2%. The uncertainty is the RSS of the ConvV uncertainty for indicated target below peremeters.



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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

E93DV3- SN:3225

January 10, 2013

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

Calibration Parameter Determined in Body Tissue Simulating Media.

f (MHz) <sup>C</sup>	Relative Permittivity*	Conductivity (S/m)	ConvF X	ConvFY	ConvFZ	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.27	6.27	8.27	0.48	1.51	1 12.0 %
900	55.0	1.05	6.12	5.12	5.12	0.73	1.25	± 12 0 %
1810	53.3	1,52	5.04	5.04	5.04	0.57	1.47	2120%
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	1.10	± 12.0 %
2600	52.5	2.16	4.11	4.11	4,11	0.67	0.99	± 12.0 %

Certificate No. E83-3225\_.fem13.

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F (requency validity of ± 100 MHz, only applies for DASY v4.4 and higher (see Page 2), also a is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvP uncertainty at pathretion frequency and the uncertainty for the indicated frequency band.

At the quencies below 3 GHz, the validity of secue parameters (it and a) can be reliased to ± 10% if local compensation formula is applied to immessed 8AR values. At frequencies ecolor 3 GHz, the validity of fesual parameters is and n) is multicled to ± 35. The secretarity is the RSS of the ConvF secretarity for indicated target festive parameters.



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Author Data **Andrew Becker**  Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3

FCC ID: L6ARFY110LW

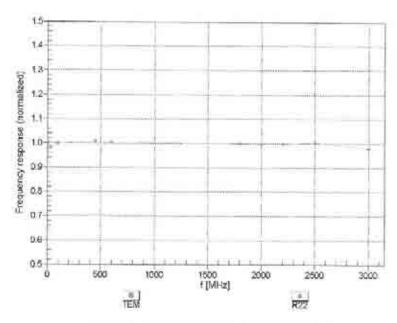
2503A-RFY110LW

E930V3-8N:3225

January 10, 2013

## Frequency Response of E-Field

(TEM-Cell:Iff110 EXX, Waveguide: R22)



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

Certificate No: ES3-3225\_Jun 13.

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Report Rev 3

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Author Data
Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID:

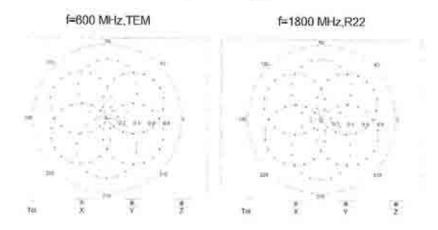
L6ARFY110LW

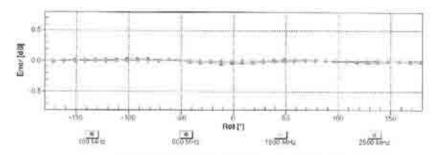
2503A-RFY110LW

E53DV3-5N:3225

January 10, 2013

## Receiving Pattern (4), 9 = 0°





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

Certificate No. ES3-3225, Jan 13

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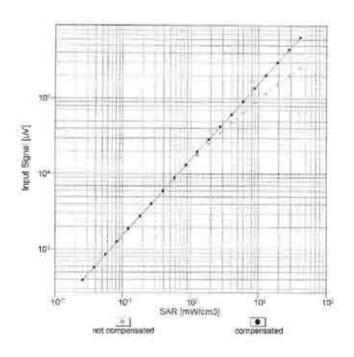
Author Data **Andrew Becker**  Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

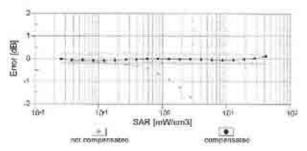
2503A-RFY110LW

ES3DV3-SN:3225

January 10, 2013.

# Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f = 900 MHz)





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

Certificate No. ES3-3225\_Jan13

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Appendix I	) for the BlackBerry $f @$ Smartphone Model RFY111LW SAR
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Author Data
Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID:

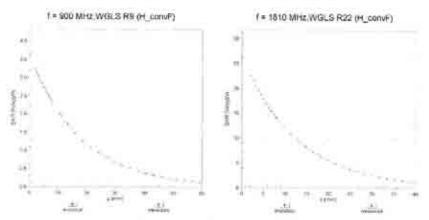
L6ARFY110LW

2503A-RFY110LW

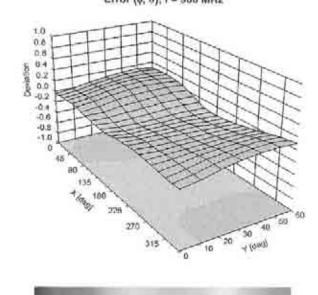
ES30V3- SN:3225

## Jamany 10, 2013

## Conversion Factor Assessment



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



-10 -0.8 -0.8 -0.4 -0.2 0.0 0.2 0.4 0.5 0.8 1 Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Certificate No: ES3-3225\_Jun 13

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Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev  $\bf 3$ 

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Author Data
Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID: L6ARFY110LW

2503A-RFY110LW

E530V3- \$N: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 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 mni
Recommended Measurement Distance from Surface	3 mm

Certificate No: E83-3225\_dan13

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Author Data
Andrew Becker

Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

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





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Accredited by the Swiss Accreditation Service (SAS)

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

Client

RTS (RIM Testing Services)

Certificate No: EX3-3548\_Jan13

Accreditation No.: SCS 108

#### **CALIBRATION CERTIFICATE**

Object

EX3DV4 - SN:3548

Calibration procedure(s)

QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4

Calibration procedure for dosimetric E-field probes

Calibration date:

January 15, 2013

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and frumidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E44198	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	John Rober
			Issued: January 15, 2013

u Inhorateur

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

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Author Data Andrew Becker Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

## Calibration Laboratory of

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





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

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

#### Glossary:

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

CF crest factor (1/duty\_cycle) of the RF signal A, B, C, D modulation dependent linearization parameters

Polarization o o rotation around probe axis

Polarization 8 9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

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

#### Calibration is Performed According to the Following Standards:

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

#### Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 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 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.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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EX3DV4 - SN:3548

**Andrew Becker** 

January 15, 2013

# Probe EX3DV4

SN:3548

Manufactured: Calibrated:

November 16, 2004 January 15, 2013

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

EX3DV4- SN:3548

January 15, 2013

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

#### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	0.36	0.44	0.43	± 10.1 %
DCP (mV) <sup>6</sup>	103.2	98.0	98.7	

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc <sup>±</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	181.3	±3.3 %
		Y	0.0	0.0	1.0		149.2	
		Z	D.0	0.0	1.0		198.9	

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%.

The uncertainties of NormX, Y, Z do not affect the E2-field uncertainty inside TSL (see Pages 5 and 6).

Numerical linearization parameter: uncertainty not required.

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



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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

EX3DV4-SN:3548

January 15, 2013

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

#### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	39.0	1.96	7.15	7.15	7.15	0.47	0.86	± 12.0 %
5200	36.0	4.66	5.13	5.13	5.13	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.79	4.79	4.79	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.61	4.61	4.61	0.45	1.80	± 13.1 %

<sup>&</sup>lt;sup>6</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS

Certificate No: EX3-3548\_Jan13 Page 5 of 11

of the Com/F uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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



Report Rev 3

Author Data Dates of Test Test Report No FCC ID: July 02 -August 15, 2013 RTS-6046-1308-34 Rev 3 L6ARFY110LW **Andrew Becker** 

2503A-RFY110LW

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EX3DV4-SN:3548 January 15, 2013

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

#### Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	52.5	2.16	7.08	7.08	7.08	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.68	4.68	4.68	0.52	1.90	± 13.1 %
5500	48.6	5.65	4.15	4.15	4.15	0.52	1.90	± 13.1 %
5800	48.2	6.00	4.19	4.19	4.19	0.60	1.90	± 13.1 %

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

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measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (s and s) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



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Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

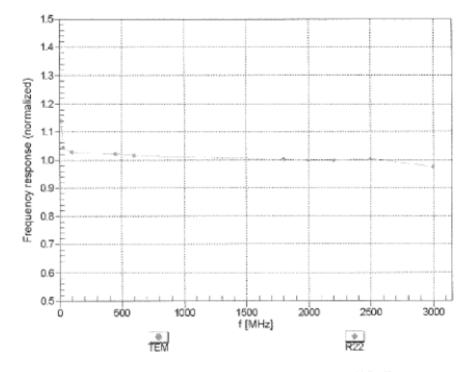
2503A-RFY110LW

EX3DV4-SN:3548

January 15, 2013

## Frequency Response of E-Field

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

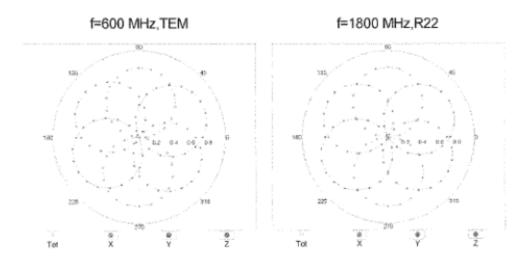


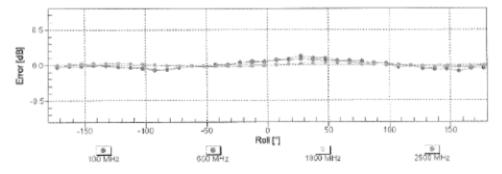
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Testing Services	Appendix D for the Black Report Rev 3	ckBerry® Smartphone Model	RFY111LW SAR	Page <b>20(49)</b>
Author Data	Dates of Test	Test Report No	FCC ID:	IC
Andrew Recker	July 02 _August 15 2013	RTS-6046-1308-34 Rev 3	I.6AREV110I.W	2503A-REV110LW

EX3DV4- SN:3548 January 15, 2013

## Receiving Pattern (4), 9 = 0°





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



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Author Data
Andrew Becker

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FCC ID:

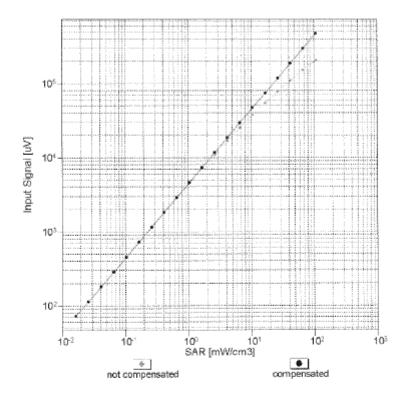
L6ARFY110LW

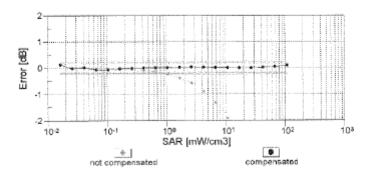
2503A-RFY110LW

EX3DV4-SN:3548

January 15, 2013

## Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f = 900 MHz)





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



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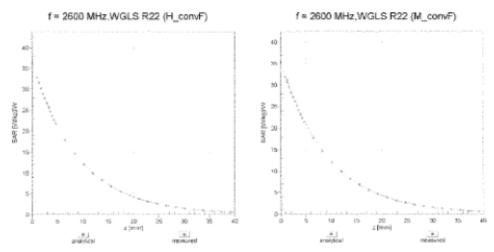
Author Data **Andrew Becker** 

Dates of Test July 02 -August 15, 2013 Test Report No RTS-6046-1308-34 Rev 3 FCC ID: L6ARFY110LW

2503A-RFY110LW

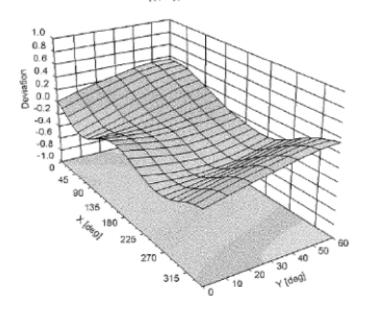
EX3DV4-- SN:3548 January 15, 2013

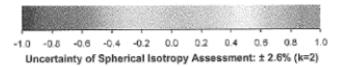
## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error (¢, 9), f = 900 MHz





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EX3DV4-SN:3548

January 15, 2013

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

#### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-72.5
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



# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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July 02 –August 15, 2013

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RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

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





S Schweizerischer Kalibrierdienst
Service suitse d'étalonnage
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S Swiss Calibration Service

Accredited by the Swas Accreditation Service (SAS)

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

lient RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D835V2-446\_Jan13

Object	D835V2 - SN: 44	6	
Califoration procedura(s)	QA CAL-05.v9		
	Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Salthration date:	January 07, 2013		
Dis calbration certificate docum	ents the traceability to nati	onal standards, which reelize the physical un	its ut measurements (SI).
he manurements and the since	rtainties with confidence p	robability are green on the following pages an	d are part of the certificate.
All calibrations have been condu	cted in the closed laborator	y tachty: environment temperature (22 ± 3)*0	C and humidity < 70%.
	www.actional.technolitesational.		
Calibration Equipment used (M&)	se annual tox cambration)		
	10.	Casi Date (Certificate No.)	Scheduled Calibration
rimary Standards ower meter EPM-442A	ID # GB37480704	01-Nov-12 (No. 217-01640)	Oct+13
rimsary Standards Swer meter EPM-642A Swer sensor HIP 8461A	ID # GB3740070# UB37290783	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct-18
rimary Standards Swer meter EPM-642A ower sensor HP 8481A	ID # GB37480704	01-Nov-12 (No. 217-01640)	Oct+13
rimary Standards Ower meter EPM-442A Ower sensor HP 8481A eference 20 d5 Attenuator	ID # GB3740070# UB37290783	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct-18
rumany Standards Swer meter EPM-442A Ower sensor HP 8461A eference 20 d6 Americator ype-N mismutch composition	ID # GB3740070# UB37292783 EM 5058 (200)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar 12 (No. 217-01530)	Oct-18 Oct-18 Apr 18
rimary Standards rower meter EPM-942A Power sensor HP 9461A Reference 20 d5 Attenuator Type-N mismutch composition Reference Proba: ESSDV3	ID # GB3740070# US37292783 58: 5058 (20s) SN: 5047.37.06327	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar 12 (No. 217-01630) 27-Mar 12 (No. 217-01633)	Oct-18 Oct-18 Apr 18 Apr-13
Primary Standards  Power meter EPM-642A  Power sensor HP 8461A  Reference 20 d8 Attenuator  Type-N mismutch complication  Reference Profile ESSDV3  DAE4  Secondary Standards	ID # GB37400704 UB37292783 521 5056 (20x) 531 5057 3 / 06327 SN 3205 SN 601	01-Nov-12 (No. 217-03540) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205 Dec12) 27-Jun-12 (No. DAE4-601 Jun12) Check Data (in house)	Oct 18 Oct 18 Apr 18 Apr 13 Dec 13 Jun-13 Scheduled Check
Primary Standards Power meter EPM-642A Power sensor HP 8461A Reference 20 dd Ameriustor Type-N mismutch complession Pellimenco Profee ESSDV3 DAF4 Secondary Standards Power sensor HP 8481A	ID # GB37400704 UB37290783 52: 5056 (20h) 5N: 5047.3 / 06327 SN: 305 SN: 601 IU # MY41092317	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. E83-3206 Dec12) 27-Jun-12 (No. DAE4-601 Jun12) Check Date (in nouse) 18-Oct-02 in house check Oct-11)	Oct 18 Oct 18 Apr 18 Apr 18 Apr 19 Dec-18 Jun-19 Scheduled Check Is house check: Oct-19
Primary Standards  Tower meter EPM-442A  Tower sensor HP 8481A  Teterance 20 d5 Attenuator  Type-N internation composation  Teterance Probe ESSDV3  TAE4  Secondary Standards  Tower sensor HP 8481A  H- generator R&S SMT-06	ID # OB37400704 US37292783 524 5858 (20h) 5N-5047,3706327 SN-3205 SN-001 IU # MY41092317 100005	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 28-Des-12 (No. ESS-3206 Dec12) 27-Jun-12 (No. DAE4-601 Jun12) Check Date (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	Oct 18 Oct 18 Apr 18 Apr 18 Apr 13 Dec-13 Jun-13 Scheduled Check Is house check: Oct-19 in house check: Oct-19
Primary Standards Power meter EPM-642A Power sensor HP 8481A Reterence 20 05 Americator Type-N mismutch composition Releience Profer ESSDV3 DAE4 Secondary Standards Power sensor HP 8481A Hi- generator PRS SMT-06	ID # GB37400704 UB37290783 52: 5056 (20h) 5N: 5047.3 / 06327 SN: 305 SN: 601 IU # MY41092317	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. E83-3206 Dec12) 27-Jun-12 (No. DAE4-601 Jun12) Check Date (in nouse) 18-Oct-02 in house check Oct-11)	Oct 18 Oct 18 Apr 18 Apr 18 Apr 13 Dec-13 Jun-13 Scheculed Check Is house check: Oct-19 in house check: Oct-19
Primary Standards  Power meter EPM-642A  Power sensor HP 8481A  Reference 20 05 Attenuetor  Pyys-R mismutch composition  Reference Probe ESSDV3  DAE4  Secondary Standards  Power sensor HP 8481A  Hi- generator P&S SMT-06	ID #  OBS7/400704 US37/29(783 EM: 5065 (204) SN: 5047.3 / 06327 SN: 3205 SN: 001  ID #  MY41092317 100005 US37/390585 S4206	01-Nov-12 (No. 217-03640) 01-Nov-12 (No. 217-03640) 27-Mar-12 (No. 217-03630) 27-Mar-12 (No. 217-03630) 28-Dec-12 (No. E83-3206 Dec12) 27-Jun-12 (No. DA64-601 Jun12) Check Date (in nouse) 18-Oct-02 (in nouse check Oct-11) 08-Oct-01 (in nouse check Oct-12)	Oct-18 Oct-18 Apr-18 Apr-13 Dec-15 Jun-13 Scheoused Check is house check: Oct-19 in house check: Oct-19 in house check: Oct-19
remany-Standards  Tower meter EPM-642A  Tower sensor HP 0461A  Tower sensor HP 0461A  Alternation  Type-N mismatch complisation  Reference Profer ES3DV3  DAE4  Secondary Standards  Tower sensor HP 8481A  H- generator R&S SMT-08  Wetwork Analyzer HP 6753E	ID #  OBS7/400704 US37296783 ENI 5056 (20x) SNI 5047.3 / 06327 SNI 3205 SNI 601  ID #  MY41092317 100005 US37390585 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. E83-3205 Dec12) 27-Jun-12 (No. DA64-601 Jun12) Check Date (in nouse) 18-Oct-02 on house check Oct-11) 04-Aug-99 (in house check Oct-12) Function	Oct 18 Oct 18 Apr 18 Apr 18 Apr 13 Dec-13 Jun-13 Scheculed Check Is house check: Oct-19 in house check: Oct-19
Primary Standarda Power meter EPM-442A Power sensor HP 0461A Reference 20 05 Attenuator Type-N mismatch combination Reference Profile ESSDV3 DAE4 Secondary Standards Power sensor HP 8481A HF-generator P&S SMT-06 Network Analyzer HP 6753E	ID #  OBS7/400704 US37/29(783 EM: 5065 (204) SN: 5047.3 / 06327 SN: 3205 SN: 001  ID #  MY41092317 100005 US37/390585 S4206	01-Nov-12 (No. 217-03640) 01-Nov-12 (No. 217-03640) 27-Mar-12 (No. 217-03630) 27-Mar-12 (No. 217-03630) 28-Dec-12 (No. E83-3206 Dec12) 27-Jun-12 (No. DA64-601 Jun12) Check Date (in nouse) 18-Oct-02 (in nouse check Oct-11) 08-Oct-01 (in nouse check Oct-12)	Oct-18 Oct-18 Apr-18 Apr-13 Dec-15 Jun-13 Scheoused Check is house check: Oct-19 in house check: Oct-19 in house check: Oct-19
Calibration Equipment used (MA) Primary Standards Power meter EP14-442A Power meter EP14-442A Power meter EP14-442A Power sensor HP 0401A Patternation Composation Refinence Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A HF generator R&S SMT-09 Network Analyzer HP 0753E Calibrated by Approved by	ID #  OBS7/400704 US37296783 ENI 5056 (20x) SNI 5047.3 / 06327 SNI 3205 SNI 601  ID #  MY41092317 100005 US37390585 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. E83-3205 Dec12) 27-Jun-12 (No. DA64-601 Jun12) Check Date (in nouse) 18-Oct-02 on house check Oct-11) 04-Aug-99 (in house check Oct-12) Function	Oct 13 Oct 13 Apr 13 Apr 13 Apr 13 Dec 13 Jun 13 Scheouse Check is house check: Oct 13 in house check: Oct 13 in house check: Oct 13

Certificate No: D835V2-446\_Jan13

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Author Data
Andrew Becker

Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43,0004 Zurich: Switzerland





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Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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#### 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
- 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%.

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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FCC ID:

L6ARFY110LW

2503A-RFY110LW

#### Measurement Conditions

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

DASY Version	DASY5	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 = 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 mhp/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 5 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		200

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Candition	
SAR measured	250 mW input power	2.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.39 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>2</sup> (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 ± 16.5 % (K=2)

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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2503A-RFY110LW

#### Appendix

#### Antenna Parameters with Head TSL

impedance, transformed to feed point	50.1 \O - 8.5 j\O	
Return Loss	- 23.7 dB	

#### General Antenna Parameters and Design

The state of the s	
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 enterms 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 leaded 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	October 24, 2001	

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID: L6ARFY110LW

2503A-RFY110LW

#### **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;  $\sigma = 0.92$  S/m;  $\epsilon_t = 42$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

#### DASY52 Configuration:

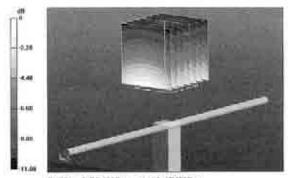
- Probe: ES3DV3 SN3205; ConvF(6.05, 6.05, 6.05); Culibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52,8.4(1052); SEMCAD X 14.6.8(7028)

#### 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/kgMaximum value of SAR (measured) = 2.79 W/kg



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



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A	ppendix D for the BlackBerry® Smartphone Model RFY111LW SAR
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Author Data
Andrew Becker

Dates of Test

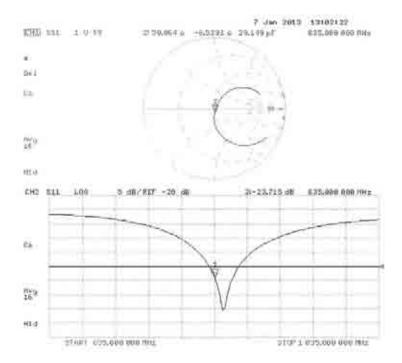
July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID: L6ARFY110LW

2503A-RFY110LW

#### Impedance Measurement Plot for Head TSL



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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrauss 43, 8004 Zuzich, Switzerfamil





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Accredited by the Swiss Accreditation Service (SAS)

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1900V2-545 Jan13

	ERTIFICATE		
Оорест	D1900V2 - SN: 5	45	
Cidilization procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Clafficontines clatic	January 09, 2013		
		onal standards, which realize the physical or ropolisty are given on the tollowing pages as	
All calibrations have been condu	sted in the closed laborator	ry tacility: environment temperature (2/2 ± 3)*	C and humidity < 70%
Calibration Equipment used (M&	TE sellical for califeration)		
Primary Standards	(D #	Cal Date (Certificate No.)	Scheduled Calibration
	ID # GB97489704	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640)	Satiodated Calibration Oct 13
Cover meter EPM-442A	The second secon	The state of the s	Oct 13 Oct 13
Power meter EPM-442A Power sensor 11P 8401A	GB37480704	01-Nov-12 (No. 217-01640)	Oet 13
Power mater LPM-442A Power sensor HP 8461A Reference 30 dB Attenuator	GB37489704 US37292783	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct 13 Oct 13
Power mater EPM-442A Power sensor HP 8401A Heference 20 dB Attenuation Type-N mismatch combination	GB97489764 US37292783 SN: 5056 (209)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mer 12 (No. 217-01630)	Oct 13 Oct 13 Apr-13
Power mater EPM-442A Power sensor IIP 8481A Heference 20 dB Attenuinot Type-N mismatch combination Reference Probe ES3DV3	GB37480704 US37292783 SN: 5056 (204) SN: 5047.3 (06327	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar 17 (No. 217-01630) 27-Mar 12 (No. 217-01633)	Oct 13 Oct 13 Apr-13 Apr-13
Power mater EPM-442A Power sensor IIP 8401A Hereinore 20 dD Attenuerer Type-N mismatch combination Reference Probe ESSDV3 DAE4	G097400704 US37292783 SN: 5058 (208) SN: 5047.3 / 08327 SN: 2208	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Marr (2 (No. 217-01630) 27-Marr (2 (No. 217-01633) 28-Den-12 (No. 217-01633)	Oct 13 Oct 13 Apr-13 Apr-13 Dec-13
Power mater LPM-442A Power sensor 11P 8401A Heference 20 dB Attenuator Type-N meanatch combination Reterence Probe ES3DV3 DAE4 Secondary Standards	GB97480704 US37292783 Sht 5056 (20kg Sht 5057 3 / 06327 Sht 2205 Sht 001	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Marr 12 (No. 217-01630) 27-Marr 12 (No. 217-01630) 28-Den-12 (No. ESS-2205 Dec12) 27-Jun-12 (No. DAE4-001 Junit2)	Oct. 13 Oct. 13 Apr. 13 Apr. 13 Dec. 13 Jun- 13
Power mater EPM-442A Power sensor IIP 8401A Reference 20 dB Attenuence Type-N resensor Combination Reference Probe ES3DV3 DAE4 Recondury Standards Power sensor HF 8481A	G097400704 US37292783 SN: 5056 (209) SN: 5047-3 (106327 SN: 3208 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mer 17 (No. 217-01630) 27-Mer 12 (No. 217-01633) 28-Den-12 (No. E33-2203 (Dec12) 27-Jun-12 (No. DAE4-001 (Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	Oct. 13  Oct. 13  Apr. 13  Apr. 13  Dec. 13  Jun- 13  Scheduled Check
Power mater LPM-442A Power sensor 11P 8401A Heference 20 dB Attenuence Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP #481A RF generator RRS SMT-06	GU37400704 US37292783 SN: 5058 (208) SN: 5047.3 (106327 SN: 2208 SN: 001	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mer 12 (No. 217-01630) 27-Mer 12 (No. 217-01633) 28-Den-12 (No. E33-2203 (Dec12) 27-Jun-12 (No. DAE4-001 (Jun12) Check Clate (in floure) 18-Oct-02 (in floure)	Oct. 13  Oct. 13  Apr. 13  Apr. 13  Dec. 13  Jun- 13  Scheduled Check In Nouse check: Oct. 13
Primary Standards Power sensor IIP 8401A Heference 20 dB Attenuance Type-N misematch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP #481A RF generator RSS SMT-06 Network Analyzer HP 8753E	GB3/480/04 US37292783 SN: 5056 (2014) SN: 5047.3 / 06327 SN: 2205 SN: 001 ID # MY41092317 100000 US37390585 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Marr 12 (No. 217-01630) 27-Marr 12 (No. 217-01633) 28-Den-12 (No. ESS-2205 Dec12) 27-Jun-12 (No. DAE4-001 Juni12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in noise check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct 13  Oct 13  Apr 13  Apr 13  Dec-13  Dec-13  Jun-13  Scheduled Check  In Nouse check: Oct-13  In hoose check: Oct-13  In hoose check: Oct-13
Power mater EPM-442A Power sensor IIP 8401A Hereisance 20 dB Attenuator Type-N insensors combination Reference Probe ESSDV3 DAE4 Secondary Standards Power sensor HP #481A RP generator RRS SMT-06 Network Analyzer HP 8753E	G097400704 US37292783 SN: 5056 (204) SN: 5047.3 (106327 SN: 2205 SN: 601 ID # MY41092317 100006	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mer 17 (No. 217-01630) 27-Mer 12 (No. 217-01633) 28-Den-12 (No. E33-2203 (Dec12) 27-Jun-12 (No. DAE4-001 (Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	Oct 13  Oct 13  Apr-13  Apr-13  Dec-13  Jun-12  Scheduled Check  In house check: Oct-13  In house check: Oct-13  In house check: Oct-13  In house check: Oct-13
Power mater LPM-442A Power sensor 11P 8401A Heference 20 dB Attenuence Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP #481A RF generator RRS SMT-06	G097480704 US37292783 Stc 5058 (204) Stc 5058 (204) Stc 50547.3 (106327 Stc 208) Stc 208 Stc 200 ID # MY41092317 100008 US37390685 S4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Marr 12 (No. 217-01630) 27-Marr 12 (No. 217-01630) 28-Den-12 (No. E35-3205 Dec12) 27-Jun-12 (No. DAE4-001 Junil2) 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) Function	Oct. 13  Oct. 13  Apr. 13  Apr. 13  Dec- 13  Jun- 13  Screethiled Check  In house check: Oct. 13  In house check: Oct. 13  In house check: Oct. 13

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Author Data
Andrew Becker

Dates of Test

July 02 -August 15, 2013

Test Report No

RTS-6046-1308-34 Rev 3

FCC ID:

L6ARFY110LW

2503A-RFY110LW

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrause 43, 8004 Zurlob, Switzerland





S Schweizerischer Kalibrierdienst

Service suisse d'étalennage

Servizio evizzero di tarature Swies Calibration Service

Accreditation No.: SCS 108

According by the Swiss According Service (SAS)

The Swiss Accreditation Service to one of the signatories to the EA Multitateral Agreement for the recognition of salibration sertificates.

#### Glossary:

TSL

tissue simulating liquid

ConvF sensiti N/A not ap

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
- 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%.

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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Author Data
Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID:

L6ARFY110LW

2503A-RFY110LW

#### Measurement Conditions

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

DASY Version	DASY5	V52.8.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantons	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	ax, ay, az = 5 mm	
Frequency	1900 MHz ± 1 MHz	

#### Head TSL parameters

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.4 ± 6 %	1,38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	-	-

#### SAR result with Head TSL

SAR averaged over 1 cm <sup>®</sup> (1 g) of Heart TSL	Condition	
SAH measured	250 mW input power	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.2 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>2</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW mput power	5.26 W/kg
SAR for nominal Head TSL parameters:	normalized to 1W	21.1 W/kg ± 16.5 % (k=2)

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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Andrew Becker

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FCC ID:

L6ARFY110LW

2503A-RFY110LW

#### Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point:	51.0 O + 1.7 JO
Return Loss	+34.3 dB

#### General Antenna Parameters and Design

promonent of the second of the	
Electrical Delay (one direction)	1.198 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the leedpoint 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 to DC-signals. On some of the dipole, small end caps are added to the dipole arms in order to improve matching which 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 hear the feedpoint may be damaged.

#### Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	November 15, 2001	

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev 3

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Andrew	Recker

Dates of	Test		
July	02 -August	15,	2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID: L6ARFY110LW

2503A-RFY110LW

#### DASY5 Validation Report for Head TSL

Date: 09.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System; CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz;  $\sigma = 1.38 \text{ S/m}$ ;  $z_c = 39.4$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

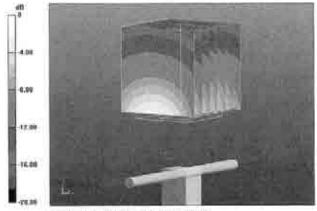
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(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=Smm, dy=Smm, dz=Smm 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

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-	ocument
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Author Data
Andrew Becker

Dates of Test

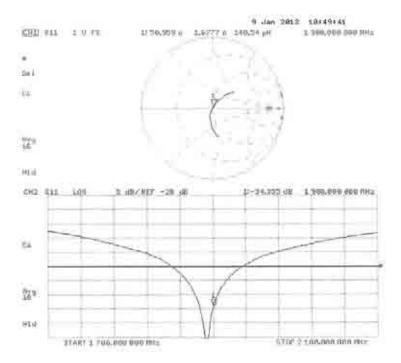
July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

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2503A-RFY110LW

#### Impedance Measurement Plot for Head TSL



9.0 = 2.7 (ACC) (48.00 + 70.03 P.C) (49.00 + 70.03 P.C)



# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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FCC ID: L6ARFY110LW

2503A-RFY110LW

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





Schweizerischer Kalibrierdienst Service sulsse d'étalonnage

C Service suisse 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

Client

RTS (RIM Testing Services)

Certificate No: D2450V2-747\_Nov11

Object	D2450V2 - SN: 7	47	<b>国际</b>
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	November 09, 20	111	
The measurements and the unce	ertainties with confidence p	ional standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature (22 ± 3)°(	nd are part of the certificate.
Calibration Equipment used (M&	TE critical for calibration)		
rimary Standards	ID#	Cal Date (Certificate No.)	Scheduled Calibration
- miles	ID # GB37480704	Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	Scheduled Calibration Oct-12
ower meter EPM-442A			
Power meter EPM-442A Power sensor HP 8481A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	GB37480704 US37292783	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	Oct-12 Oct-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	GB37480704 US37292783 SN: 5086 (20g)	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	Oct-12 Oct-12 Apr-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	Oct-12 Oct-12 Apr-12 Apr-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 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. ES3-3205_Apr11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Apr-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-12

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Author Data

Dates of Test

Test Report No

FCC ID:

Andrew Becker July 02 -August 15, 2013 RTS-6046-1308-34 Rev 3

L6ARFY110LW

2503A-RFY110LW

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

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:

tissue simulating liquid TSL

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

#### Calibration is Performed According to the Following Standards:

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

#### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

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

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Dates of Test

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FCC ID:

L6ARFY110LW

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#### **Measurement Conditions**

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

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

# **Head TSL parameters**

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.7 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

# SAR result with Head TSL

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

SAR averaged over 10 cm <sup>3</sup> (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)

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FCC ID:

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# **Appendix**

#### **Antenna Parameters with Head TSL**

Impedance, transformed to feed point	$52.5 \Omega + 1.3 j\Omega$		
Return Loss	- 31.2 dB		

#### **General Antenna Parameters and Design**

Florida I Dalay (and discalled)	4.404
Electrical Delay (one direction)	1.161 ns

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

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

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

#### **Additional EUT Data**

Manufactured by	SPEAG	
Manufactured on	December 01, 2003	

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Andrew Becker

Dates of Test

July 02 –August 15, 2013

Test Report No **RTS-6046-1308-34 Rev 3** 

FCC ID:

L6ARFY110LW

2503A-RFY110LW

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

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



0 dB = 17.780 mW/g



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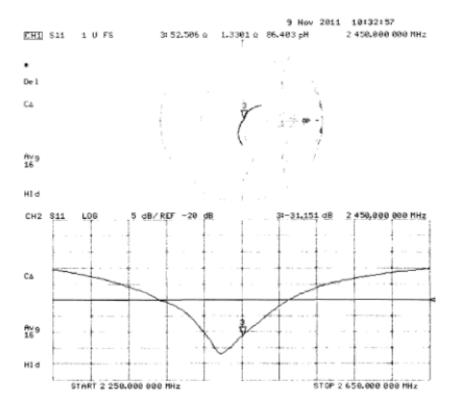
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# Impedance Measurement Plot for Head TSL





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2503A-RFY110LW

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





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Client RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D5GHzV2-1033\_Nov11

Dbject	D5GHzV2 - SN:	1033	coasteral series
Calibration procedure(s)	QA CAL-22.v1 Calibration proce	all two flow idligates a miliable them below to the	ween 3-6 GHz
Calibration date:		Market State of the State of th	
The measurements and the unce	ertainties with confidence p	ional standards, which realize the physical un robability are given on the following pages an ry facility: environment temperature (22 ± 3)*(	ad are part of the certificate.
Primary Standards	lip.	Cal Date (Certificate No.)	Scheduled Calibration
		Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451)	Scheduled Calibration
Power meter EPM-442A	ID # GB37480704 US37292783	05-Oct-11 (No. 217-01451)	Scheduled Calibration Oct-12 Oct-12
Power meter EPM-442A Power sensor HP 8481A	GB37480704 US37292783	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	Oct-12 Oct-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	GB37480704	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	Oct-12 Oct-12 Apr-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	GB37480704 US37292783 SN: 5086 (20g)	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	Oct-12 Oct-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	Oct-12 Oct-12 Apr-12 Apr-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12
Primary Standards Power meter EPM-442A Power sensor HP B481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP B481A	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12 Jul-12
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12 Jul-12 Scheduled Check
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID # MY41092317	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID # MY41092317 100005	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Mar-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13
Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3503 SN: 601 ID # MY41092317 100005 US37390585 S4206	05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-12 Apr-12 Mar-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-12

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Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

#### Glossary:

TSL ConvF N/A

tissue simulating liquid

sensitivity in TSL / NORM x,v,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
- 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.

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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#### Measurement Conditions

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

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

#### Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

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

#### SAR result with Head TSL at 5200 MHz

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

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

# Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

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

# SAR result with Head TSL at 5500 MHz

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

SAR averaged over 10 cm <sup>3</sup> (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 ± 16.5 % (k=2)

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# Appendix D for the BlackBerry® Smartphone Model RFY111LW SAR Report Rev $\bf 3$

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

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



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#### Appendix

#### Antenna Parameters with Head TSL at 5200 MHz

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

#### Antenna Parameters with Head TSL at 5500 MHz

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 Ω - 4.3 jΩ
Return Loss	- 22.6 dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 ns

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

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

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

### **Additional EUT Data**

Manufactured by	SPEAG
Manufactured on	July 09, 2004

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#### 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;  $\sigma = 4.46 \text{ mho/m}$ ;  $\varepsilon_r = 34.6$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used: f = 5500 MHz;  $\sigma = 4.75 \text{ mho/m}$ ;  $\varepsilon_r = 34.2$ ;  $\rho = 1000 \text{ kg/m}^3$ , Medium parameters used: f = 5800 MHz;  $\sigma = 5.03 \text{ mho/m}; \epsilon_r = 33.7; \rho = 1000 \text{ kg/m}^3$ 

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/gMaximum 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

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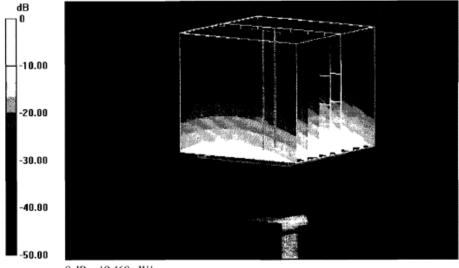
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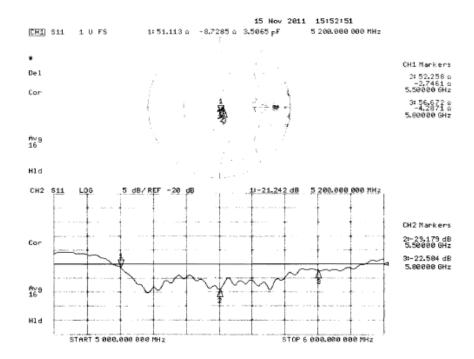
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# Impedance Measurement Plot for Head TSL



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