SlackBerr	1	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho eport	ne Model	Page 1(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12 –	October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

=== Black	Rerry	Appendix D for the RFV121LW SAR F	e BlackBerry® Smartpho Report	ne Model	Page 2(61)
Author Data	Dates of Test	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
	Calibration Labo Schmid & Partner Engineering AG Zeughausstrasse 43, 80	[	HAC MILA CONSTRUCTION SC CONSTRUCTION SC SC SC SC SC SC SC SC	Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service	
	The Swiss Accreditation	coreditation Service (SAS) Service is one of the signatories or the recognition of calibration o	to the EA	40.: SCS 108	
	Client RTS (RIM	Testing Services)	Certificate No:	ES3-3225_Jan13	
	CALIBRATIC	ON CERTIFICATE			]
	Object	ES3DV3 - SN:322	25		
	Calibration procedure(s)		A CAL-23.v4, QA CAL-25.v4 dure for dosimetric E-field probes		
			cial standards, which realize the physical units		
		n conducted in the closed laboratory and (M&TE critical for calibration)	/ facility: environment temperature (22 $\pm$ 3)*C $_{\rm 2}$	and humidity < 70%.	
					1
	Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration	1
	Power motor E4419B	GB41293874 MY41498087	29-Mar 12 (No. 217-01508)	Apr-13	-
	Power sensor E4412A Reference 3 dB Attenua		29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531)	Apr-13 Apr-13	1
	Reference 20 dB Attenu	the second se	27-Mar-12 (No. 217-01529)	Apr-13	
	Reference 30 dB Attenu	ator SN: \$5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13	
	Reference Probe ES3D		28-Dec-12 (No. ES3-3013_Dec12)	Dec-13	1
	DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13	1
	Secondary Standards	ID	Check Date (in house)	Scheduled Check	1
	RF generator HP 96480		4-Aug-99 (In house check Apr-11)	In house check: Apr-13	1
	Network Analyzer HP 8		18-Oct-01 (in house check Oct-12)	In house check: Oct-13	1
	[		Energian	Rinnatura	
	Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature	
	Approved by:	Katja Poković	Technical Manager	be def	
	This calibration certificat	e shall not be reproduced except in	full without written approval of the faboratory.	Issued: January 14, 2013	
	Certificate No: ES3-32	25_Jan13	Page 1 of 11		-

<b>∷</b> Black	Berry			Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report					
Author Data Andrew Becker	Dates of Test July 12	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW					
	Calibration Lab Schmid & Partne Engineering AG Zeughausstrasse 43, 80	r G	ILAC MARA	Service suisse d'étalonnage Service suissero di taratura					
	The Swiss Accreditatio Multilateral Agreement Glossary: TSL NORMX,y,z ConvF DCP	Accreditation Service (SAS) n Service is one of the signatories for the recognition of calibration of tissue simulating liquid sensitivity in free space sensitivity in TSL / NORM diode compression point recot feator (didth protect)	to the EA certificates fx,y,z	Accreditation No.: SCS 108					
	CF A, B, C, D Polarization o Polarization 8	crest factor (1/duty_cycle modulation dependent lin φ rotation around probe a 9 rotation around an axis i.e., 9 = 0 is normal to pro	earization parameters ixis that is in the plane normal to probe	axis (at measurement center),					
	<ul> <li>a) IEEE Std 15</li> <li>Absorption I Techniques</li> <li>b) IEC 62209-</li> </ul>	28-2003, "IEEE Recommend Rate (SAR) in the Human Hea ", December 2003 1, "Procedure to measure the	the Following Standards: ed Practice for Determining the Peal d from Wireless Communications D Specific Absorption Rate (SAR) for I 00 MHz to 3 GHz)", February 2005	evices: Measurement					
	<ul> <li>NORMx,y,z NORMx,y,z uncertainty</li> <li>NORM(I)x,y implemente</li> </ul>	are only intermediate values, inside TSL (see below ConvF ,z = NORMx,y,z * frequency_	tion 3 = 0 (f ≤ 900 MHz in TEM-cell; i.e., the uncertainties of NORMx,y,z	does not affect the E <sup>2</sup> -field Chart). This linearization is	(				
	signal (no u	ncertainty required). DCP doe s the Peak to Average Ratio t	n parameters assessed based on th es not depend on frequency nor med hat is not calibrated but determined	ia.					
	the data of media. VR i ConvF and Standard fo measureme boundary o used in DA to NORMx, ConvF is us MHz.	power sweep for specific mod s the maximum calibration ran Boundary Effect Parameters: r f $\leq$ 800 MHz) and inside way inits for f > 800 MHz. The sam compensation (alpha, depth) of SV4 software to improve prob- y,z * ConvF whereby the unce- sed in DASY version 4.4 and t	B, C, D are numerical linearization p ulation signal. The parameters do no nge expressed in RMS voltage across Assessed in flat phantom using E-fit veguide using analytical field distribu e setups are used for assessment of which typical uncertainty values are e accuracy close to the boundary. Th ritainty corresponds to that given for higher which allows extending the values.	at depend on frequency nor s the diode. eld (or Temperature Transfer tions based on power (the parameters applied for given. These parameters are the sensitivity in TSL corresponds <i>ConvF</i> . A frequency dependent lidity from ± 50 MHz to ± 100					
	<ul> <li>exposed by</li> <li>Sensor Offs</li> </ul>	a patch antenna.	tropy): in a field of low gradients real onds to the offset of virtual measure						
	Certificate No: ES3-32	595 Lair 4 2	Page 2 of 11						

SlackBern	y	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>4(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

ES3DV3 - SN: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\_Jan13

Page 3 of 11

ES3DV3- SN:3225

January 10, 2013

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

#### **Basic Calibration Parameters**

and the second sec	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 (mV) <sup>8</sup>	100.5	101.5	99.9	

#### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	С	D dB	VR mV	Unc <sup>t</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	157.5	±2.7 %
		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%.

- <sup>8</sup> Numerical linearization parameter: uncertainty not required.
  <sup>6</sup> Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: ES3-3225\_Jan13

Page 4 of 11

<sup>&</sup>lt;sup>6</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

😳 BlackBen		Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho eport	ne Model	Page 6(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12 –	October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

ES3DV3-SN:3225

January 10, 2013

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

f (MHz) <sup>c</sup>	Relative Permittivity <sup>#</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.56	6.56	8.56	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	± 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 %

Calibration Parameter Determined in Head Tissue Simulating Media

<sup>C</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 of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. <sup>7</sup> At frequencies below 3 GHz, the validity of issue parameters (c and e) can be relaxed to ± 10% if isquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (c and e) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: ES3-3225\_Jan13

Page 5 of 11

SlackBer		dix D for the BlackBerry® Smartp 1LW SAR Report	phone Model	Page <b>7(61)</b>
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	July 12 – Octob	<b>RTS-6046-1310-25</b>	L6ARFV120LW	

E\$3DV3- \$N:3225

January 10, 2013

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

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

f (MHz) <sup>c</sup>	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=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	± 12.0 %
1810	53.3	1.52	5.04	5.04	5.04	0.57	1.47	± 12,0 %
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 %

<sup>C</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 of the Cork/F uncertainty at calibration frequency and the uncertainty for the indicated frequency band. <sup>\*</sup> At frequencies below 3 GHz, the validity of basive parameters (ii and ii) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies active 3 GHz, the validity of tissue parameters (iii and ii) can be relaxed to ± 10%. The uncertainty is the RSS of the Cork/F uncertainty for indicated target tissue parameters.

Certificate No: ES3-3225\_Jan13

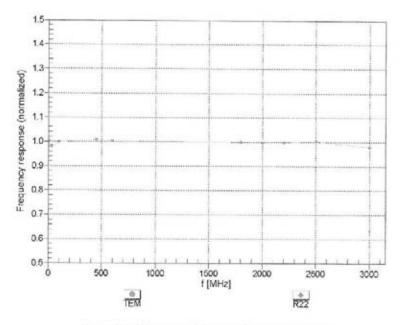
Page 6 of 11

*** BlackBerr	y	Appendix D for the RFV121LW SAR F	e BlackBerry® Smartpho Report	one Model	Page <b>8(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

ES3DV3- SN: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)

Certificate No: ES3-3225\_Jan13

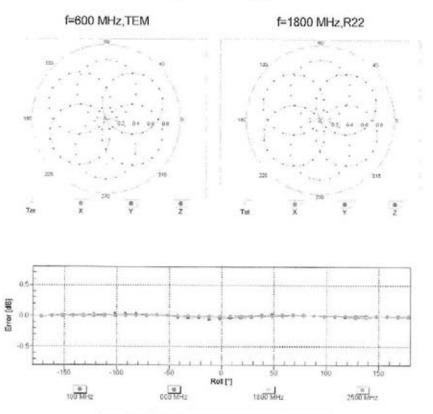
Page 7 of 11

SlackBern	y		ppendix D for the BlackBerry® Smartphone Model FV121LW SAR Report Test Report No FCC ID:		
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

E53DV3- SN:3225

January 10, 2013

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



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

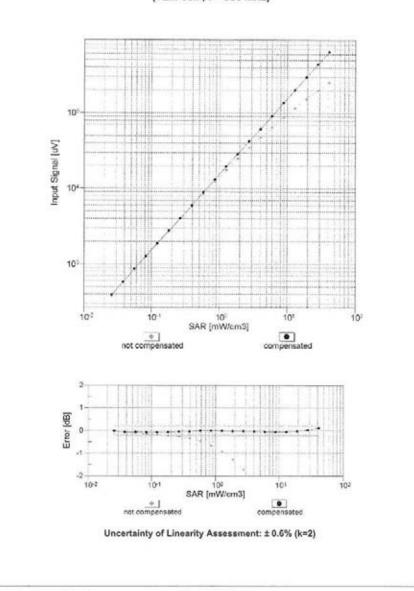
Certificate No: ES3-3225\_Jan13

Page 8 of 11

SlackBerr		for the BlackBerry® Smartpho SAR Report	one Model	Page 10(61)			
Author Data	Dates of Test	Test Report No	FCC ID:				
Andrew Becker	July 12 – October 16,						

ES3DV3- SN:3225

January 10, 2013



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

Certificate No: ES3-3225\_Jan13

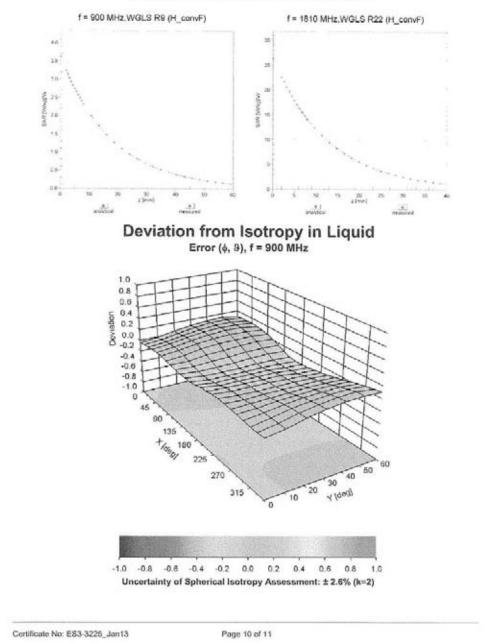
Page 9 of 11

😳 BlackBer	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 11(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

```
ES3DV3- SN:3225
```

January 10, 2013

### **Conversion Factor Assessment**



This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBer	Ŋ	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 12(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

ES3DV3- 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 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

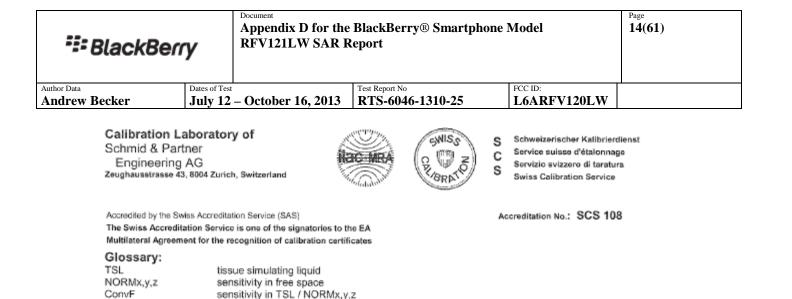
Certificate No: ES3-3225\_Jan13

Page 11 of 11

BlackBerry		Appendix D for the RFV121LW SAR F	e Model	13(61)	
ecker	Dates of Test July 12	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
Calibration Schmid & Pa Engineerin <sup>Zeughausstrasse</sup>	artner 1g AG			Service suisse d'étalonnag	je
The Swiss Accred Multilateral Agree	ditation Servi ement for the	itation Service (SAS) lee is one of the signatories to recognition of calibration cer sting Services)	o the EA tificates	n No.: SCS 108	
020534943	n de grande de de la referencia	CERTIFICATE			
Object		EX3DV4 - SN:3548			
Calibration proces	dure(s)		CAL-14.v3, QA CAL-23.v4, G ire for dosimetric E-field probe		
			il standards, which realize the physical ur ability are given on the following pages a		
This calibration ce The measurement All calibrations hav	its and the uni	ments the traceability to nationa certainties with confidence prob		nd are part of the certificate.	
This calibration ce The measurement All calibrations has Calibration Equips	its and the un we been cond ment used (M	ments the traceability to nationa certainties with confidence prob lucted in the closed laboratory fi &TE critical for calibration)	ability are given on the following pages a acility: environment temperature (22 ± 3)	nd are part of the certificate.	
This calibration ce The measurement All calibrations har Calibration Equips Primary Standard	its and the unive been cond ment used (M	ments the traceability to nationa certainties with confidence prob lucted in the closed laboratory fi &TE critical for calibration)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration	
This calibration ce The measurement All calibrations has Calibration Equips	its and the universe been cond ment used (M ds \$196	ments the traceability to nationa certainties with confidence prob lucted in the closed laboratory fi &TE critical for calibration)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508)	nd are part of the certificate.	
This calibration ce The measurement All calibrations har Calibration Equips Primary Standard Power meter E44 Power sensor E4	Its and the universe been cond ment used (M tas \$198 1412A	ments the traceability to nationa certainties with confidence prob lucted in the closed laboratory fi &TE critical for calibration) ID GB41293874 MY41498087	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13	
This calibration ce The measurement All calibrations har Calibration Equips Primary Standard Power meter E44	Its and the universe been cond ment used (M tas £198 14.12A Attenuator	ments the traceability to nationa certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508)	Ind are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13	
This calibration ce The measurement All calibrations hav Calibration Equips Primary Standard Power meter E44 Power sensor E4 Reference 3 dB A	Its and the universe been cond ment used (M tas £198 14.12A Attenuator Attenuator	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fit &TE critical for calibration) ID GB41293874 MY41498067 SIN: S5054 (3c)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508)	C and humidity < 70%. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13	
This calibration ce The measurement All calibrations hav Calibration Equips Primary Standard Power meter E44 Power sensor E4 Reference 3 dB A Reference 20 dB	its and the universe been cond ment used (M ds £196 14.12A Attenuator Attenuator Attenuator	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fit &TE critical for calibration) ID GB41293874 MY41498067 SIN: S5054 (3c) SIN: S5056 (20b)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01503) 27-Mar-12 (No. 217-01529)	C and humidity < 70%. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Apr-13	
This calibration ce The measurement All calibrations hav Calibration Equips Primary Standard Power meter E44 Power sensor E4 Reference 3 dB / Reference 20 dB Reference 30 dB	its and the universe been cond ment used (M ds £196 14.12A Attenuator Attenuator Attenuator	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fit &TE critical for calibration) ID GB41293874 MY41498067 SIN: S5054 (3c) SIN: S5056 (20b) SIN: S5129 (30b)	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01529) 27-Mar-12 (No. 217-01529)	C and humidity < 70%. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Apr-13 Apr-13 Apr-13	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power meter E44 Power sensor E44 Reference 3 dB / Reference 3 dB / Reference 3 dB Reference 3 dB	its and the universe been cond ment used (M ds £198 £198 £198 £198 £198 £198 £198 £198	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5096 (20b) SN: S5096 (20b) SN: S5129 (30b) SN: 3013 SN: 660	ability are given on the following pages a acility: environment temperature (22 ± 3) Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power standard Power sensor E44 Reference 3 dB A Reference 3 dB Reference 30 dB Reference 30 dB Reference 20 dB Reference 20 dB	tis and the universe been cond ment used (M 55 6196 6412A Attenuator Attenuator Attenuator ES3DV2 dards	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) Check Date (in house)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power standard Power standard Power standard Reference 3 dB / Reference 20 dB Reference 20 dB Reference 20 dB Reference Probe DAE4	its and the universe been cond ment used (M ds 1996 1412A Attenuator Attenuator Attenuator ES3DV2 dards 2 8548C	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID US3642U01700	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) Check Date (in house) 4-Aug-99 (in house check Apr-11)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Apr-13	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power standard Power sensor E44 Reference 3 dB A Reference 3 dB Reference 30 dB Reference 30 dB Reference 20 dB Reference 20 dB	its and the universe been cond ment used (M ds 1996 1412A Attenuator Attenuator Attenuator ES3DV2 dards 2 8548C	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) Check Date (in house)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power standard Power standard Power standard Reference 3 dB / Reference 20 dB Reference 20 dB Reference 20 dB Reference Probe DAE4	its and the universe been cond ment used (M ds 1996 1412A Attenuator Attenuator Attenuator ES3DV2 dards 2 8548C	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293874 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID US3642U01700	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) Check Date (in house) 4-Aug-99 (in house check Apr-11)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Apr-13	
This calibration or The measurement All calibrations hav Calibration Equips Primary Standard Power standard Power standard Power standard Reference 3 dB / Reference 20 dB Reference 20 dB Reference 20 dB Reference Probe DAE4	its and the universe been cond ment used (M ds 1996 1412A Attenuator Attenuator Attenuator ES3DV2 dards 2 8548C	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fit &TE critical for calibration) ID GB41293674 MY41498067 SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID US3642U01700 US37390585	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) - Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Dct-01 (in house check Oct-12)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Dec-13 Jun-13 Scheduled Check In house check: Apr-13 In house check: Oct-13	
This calibration ce The measurement All calibrations hav Calibration Equips Primary Standard Power sensor E4 Power sensor E4 Reference 3 dB / Reference 20 dB Reference 20 dB Reference 9 dB Reference Probe DAE4 Secondary Stand RF generator HP Network Analyze	its and the universe been cond ment used (M ds 1996 1412A Attenuator Attenuator Attenuator ES3DV2 dards 9 8548C	ments the traceability to national certainties with confidence prob lucted in the closed laboratory fr &TE critical for calibration) ID GB41293674 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID US3642U01700 US37390585 Name	ability are given on the following pages a acility: environment temperature (22 ± 3)* Cal Date (Certificate No.) 29-Mar-12 (No. 217-01508) 29-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01508) 27-Mar-12 (No. 217-01531) 27-Mar-12 (No. 217-01532) 28-Dec-12 (No. ES3-3013_Dec12) 20-Jun-12 (No. DAE4-660_Jun12) Check Date (in house) 4-Aug-99 (in house check Apr-11) 18-Oct-01 (in house check Oct-12) Function	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration Apr-13 Apr-13 Apr-13 Apr-13 Dec-13 Jun-13 Dec-13 Jun-13 Scheduled Check In house check: Apr-13 In house check: Oct-13	

Certificate No: EX3-3548\_Jan13

Page 1 of 11



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

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

diode compression point

or rotation around probe axis

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

Calibration is Performed According to the Following Standards:

crest factor (1/duty\_cvcle) of the RF signal

modulation dependent linearization parameters

#### Methods Applied and Interpretation of Parameters:

Techniques", December 2003

 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 E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).

 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

- 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 includer
  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.

Certificate No: EX3-3548\_Jan13

DCP

A, B, C, D

Polarization o

Polarization 8

CF

Page 2 of 11

SlackBern	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 15(61)		
Author Data	Dates of Test		Test Report No	FCC ID:			
Andrew Becker	July 12	– October 16, 2013					

EX3DV4 - SN:3548

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!)

Certificate No: EX3-3548\_Jan13

Page 3 of 11

This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBern	y	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 16(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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>8</sup>	103.2	98.0	98.7	

#### Modulation Calibration Parameters

UID	Communication System Name		А	В	С	D	VR	Unc <sup>E</sup>
			dB	dBõV		dB	mV	(k=2)
0	CW	Х	0.0	0.0	1.0	0.00	181.3	±3.3 %
		Y	0.0	0.0	1.0		149.2	
		Z	0.0	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%.

- <sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).
  <sup>8</sup> Numerical linearization parameter: uncertainty not required.
  <sup>4</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: EX3-3548\_Jan13

This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBerr	у		Test Report No FCC ID:		Page 17(61)		
Author Data	Dates of Test		Test Report No FCC ID:				
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW			

EX3DV4- SN:3548

January 15, 2013

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

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
2600	39.0	1.96	7.15	7.15	7.15	0.47	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 %

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

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

<sup>1</sup> At frequencies below 3 GHz, the validity of tissue parameters (a 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 (a and o) is restricted to ± 5%. The uncartainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX3-3548\_Jan13

Page 5 of 11

SlackBerr	y	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 18(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

EX3DV4- SN:3548

January 15, 2013

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

f (MHz) <sup>C</sup>	Relative Permittivity	Conductivity (S/m) <sup>F</sup>	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 %

the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX3-3548\_Jan13

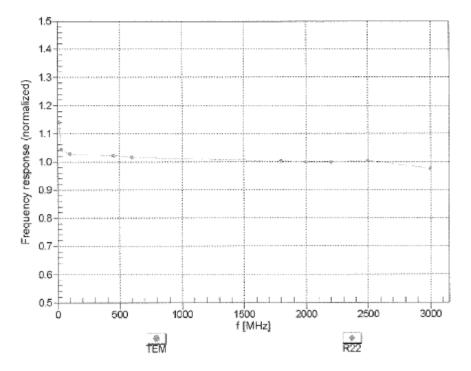
Page 6 of 11

👯 BlackBen		Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 19(61)
Author Data	Dates of Test	0 / 1 1 / 2012	Test Report No	FCC ID:	
Andrew Becker	July 12 -	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

EX3DV4-- SN:3548

January 15, 2013





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

Certificate No: EX3-3548\_Jan13

Page 7 of 11

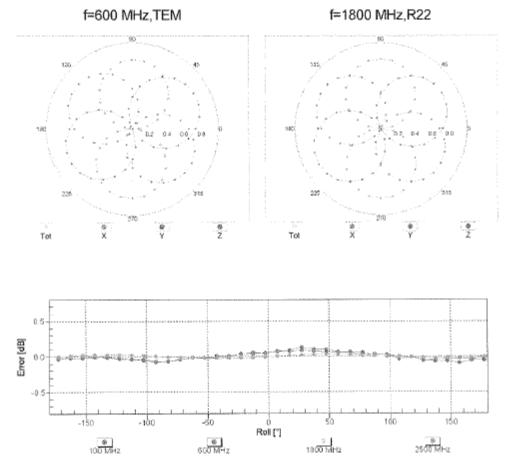
This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBern	y	Document Appendix D for the RFV121LW SAR F	BlackBerry® Smartpho Report	ne Model	Page <b>20(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

EX3DV4- SN:3548

January 15, 2013

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



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

Certificate No: EX3-3548\_Jan13

Page 8 of 11

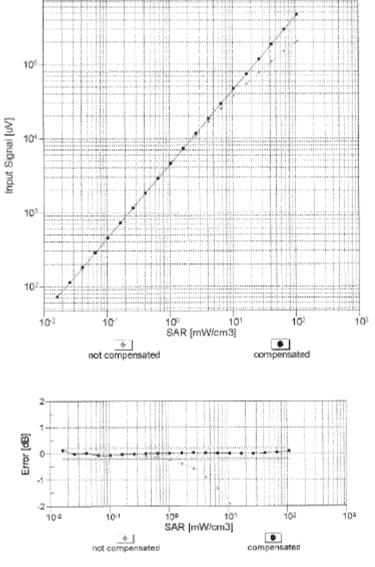
This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

*# BlackBer		) for the BlackBerry® Smartph 7 SAR Report	one Model	Page <b>21(61)</b>
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	July 12 – October 16	5, 2013 RTS-6046-1310-25	L6ARFV120LW	

EX3DV4- SN:3548

January 15, 2013

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

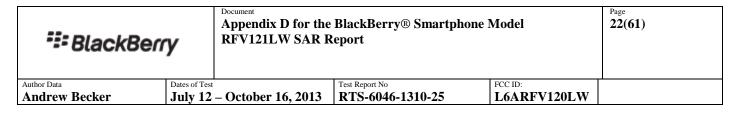


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: EX3-3548\_Jan13

Page 9 of 11

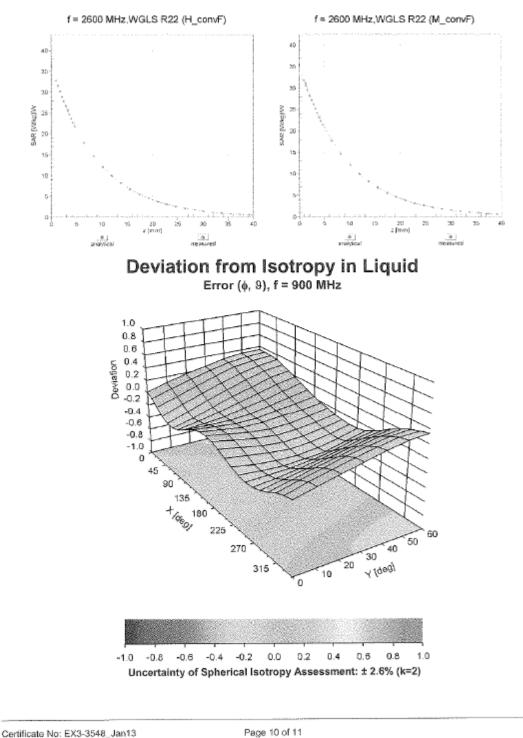
This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited



EX3DV4-- SN:3548

January 15, 2013

## **Conversion Factor Assessment**



This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>23(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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 Dlameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Certificate No: EX3-3548\_Jan13

Page 11 of 11

<text></text>	BlackBerry		Appendix D for the RFV121LW SAR F	e BlackBerry® Smartpho Report	one Model	Page <b>24(61)</b>
<section-header><text><text><text><text><text><text></text></text></text></text></text></text></section-header>	ata ew Becker					I
Image:		Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Accredited by the Swiss Ac The Swiss Accreditation 3	I Zurich, Switzerland creditation Service (SAS) Service is one of the signatories	Accreditation	Service suisse d'étalonnage Servizio svizzero di taratura S Swiss Calibration Service	
Object         D750V3 - SN: 1021           Calibration procedure(x)         QA CAL-05,v9 Calibration procedure for dipole validation kits above 700 MHz           Calibration date:         January 07, 2013           This calibration certificate documents the traceability to national standards, which reake the physical units of measurements (5). The measurements and the uncertainties with certificate or calibration gages and are part of the certificate.           All calibration Equipment used (M&TE critical for calibration)         Primary Standards           Primary Standards         D1 8         Cal Date (Certificate No.)         Schedule Calibration           Power sense VP 9481A         UIS37282783         014/w-12 (No. 277-01660)         Cel-13           Power sense VP 9481A         Stit 601         27-Jun-12 (No. 277-01660)         Cel-13           Power sense VP 9481A         Stit 601         27-Jun-12 (No. 277-01660)         Cel-13           Reference Probe ES3DV3         Stit 601         27-Jun-12 (No. 267-0160)         Cel-13           Secondary Standards         ID #         Calex1 Date (In texts)         Ap-13           Secondary Standards         ID #         Calex1 Date (In texts)         Ap-13           Secondary Standards         ID #         Calex1 Date (In texts)         Ap-13           Secondary Standards         ID #         Calex1 Date (In texts)         Ap-13 <td></td> <td>and a second second</td> <td>erress scholes strongenerations - Laurer</td> <td></td> <td>No: D750V3-1021_Jan13</td> <td></td>		and a second second	erress scholes strongenerations - Laurer		No: D750V3-1021_Jan13	
Calibration procedum(s)       QA CAL-05,v9 Calibration procedure for dipole validation kits above 700 MHz         Calibration date:       January 07, 2013         This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (8). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.         All catibration Equipment used (MATE critical for calibration)       Scheduled Calibration         Primary Standardis       0.8       Calibration (2003)       Scheduled Calibration         Primary Standardis       0.8       Calibration (2004)       Scheduled Calibration         Primary Standardis       0.8       Calibration (2004)       Calibration (2004)       Calibration (2004)         Prover most FIP 442A       G837480706       01-13       Calibration (2004)       Calibration (2004)         Prover sonsor HIP 4481A       US37282783       01-Nov-12 (No. 217-01640)       Col-13         Reference 20 GB Alternation       SN: 5004; 20052       27-Aun-12 (No. 253-205, Dec12)       Dec-13         Dacid       SN: 5007; 201527       Techcholard Calibration       More 12         Prover sonsor HIP 4481A       US372905805       27-Jun-12 (No. ES3-3205, Dec12)       Dec-13         Dacid       SN: 5007; 201527       Techcholard Calibration       In house check; Cc+13		CALIBRATIO	N CERTIFICATE			
Calibration procedure for dipole validation kits above 700 MHz         Calibration date:       January 07, 2013         This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (S). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.         All calibrations have been conducted in the closed taboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.		Object	D750V3 - SN: 102	n Handshelen Konstan	CARLES CARLES	
This calibration certificate documents the traceability on 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 calibration Equipment used (M&TE critical for calibration)         Primary Standards       10 #       Cal Date (Confidente No.)       Scheduled Calibration         Power most FPM-442A       0837480704       01-Nov-12 (No. 217-01640)       Oct-13         Power sensor HP 8481A       US37282783       01-Nov-12 (No. 217-01640)       Oct-13         Reference 20 dB Attenuator       SN: 5058 (200k)       27-Ahar-12 (No. 217-01530)       Apr-13         Type-N mismatch combination       SN: 5053 (200k)       27-Ahar-12 (No. 217-01530)       Apr-13         Reference 20 dB Attenuator       SN: 5053 (200k)       27-Ahar-12 (No. 217-01530)       Apr-13         Date       SN: 601       27-Jun-12 (No. 217-01530)       Apr-13         DAE4       SN: 601       27-Jun-12 (No. 217-01530)       Apr-13         DAE4       SN: 601       27-Jun-12 (No. 217-01530)       Apr-13         DAE4       SN: 601       27-Jun-12 (No. 217-01530)       Apr-13         Network Analyzer HP 8753E       D #       Check Date (in house)       Scheduled Check         Power sensor HP 8481A		Calibration procedure(s)		ture for dipole validation kits at	bove 700 MHz	
Calibration Equipment used (M&TE critical for calibration)         Primary Standards       ID #       Cal Date (Certificate No.)       Scheduled Calibration         Power motor EPM-442A       GB37480704       01-Nov-12 (No. 217-01840)       Oct-13         Power motor EPM-442A       GB37480704       01-Nov-12 (No. 217-01840)       Oct-13         Power motor EPM-442A       GB37480704       01-Nov-12 (No. 217-01840)       Oct-13         Power motor EPM-442A       GB37480704       01-Nov-12 (No. 217-01830)       Apr-13         Power motor EPM-442A       SN: 5058 (20k)       27-Mar-12 (No. 217-01530)       Apr-13         Type-N mismatch combination       SN: 5057 28-Dec12 (No. ES3-3205_Dec12)       Dec-13         N: 3005       28-Dec-12 (No. DAE4-601_Jun12)       Jun-13         Secondary Standards       ID #       Check Date (in house)       Scheduled Check         Power sensor HP 8481A       MY41092317       18-Oct-02 (in house check Oct-11)       In house check: Oct-13         Network Analyzer HP 8753E       US37390585 S4208       18-Oct-01 (in house check Oct-12)       In house check: Oct-13         Network Analyzer HP 8753E       Name       Function       Signature         Calibrated by:       Name       Function       Signature		This calibration certificate	documents the traceability to natio	nal standards, which realize the physical r		
Primary Standards         ID #         Cal Date (Cortificate No.)         Scheduled Calibration           Power motor EPM-442A         GB37480704         01-Nov-12 (No. 217-01640)         Oct-13           Power sensor HP 8481A         US37292783         01-Nov-12 (No. 217-01640)         Oct-13           Reference 20 dB Attenuator         SN: 5058 (20)         27-Mar-12 (No. 217-01530)         Apr-13           Type-N mismatch combination         SN: 5047.37.06327         27-Mar-12 (No. ES3-3205_Dec12)         Dec-13           Reference Probe ES3DV3         SN: 3205         28-Dec-12 (No. ES3-3205_Dec12)         Dec-13           DAE4         SN: 601         27-Jun-12 (No. DAE4-601_Jun12)         Jun-13           Secondary Standards         ID #         Check Date (in house)         Scheduled Check           Power sensor HP 6481A         MY41092317         18-Oct-02 (in house check Oct-11)         In house check: Oct-13           RF generator R&S SMT-06         100005         04-Aug-99 (in house check Oct-12)         In house check: Oct-13           Network Analyzer HP 8753E         US37390585 S4206         18-Oct-01 (in house check Oct-12)         In house check: Oct-13           Calibrated by:         Leif Klysner         Laboratory Technician         Signature		All calibrations have been	conducted in the closed laboratory	facility: environment temperature (22 $\pm$ 3	)°C and humidity < 70%.	
Power mater EPM-442A     GB37480704     01-Nov-12 (No. 217-01640)     Oct-13       Power sensor HP 8481A     US37292783     01-Nov-12 (No. 217-01640)     Oct-13       Reference 20 dB Attenuator     SN: 5058 (20k)     27-Mar-12 (No. 217-01530)     Apr-13       Type-N mismatch combination     SN: 5047.3 / 06327     27-Mar-12 (No. 217-01533)     Apr-13       Reference Probe ES3DV3     SN: 5047.3 / 06327     27-Mar-12 (No. 217-01533)     Apr-13       DAE4     SN: 3205     28-Dec-12 (No. ES3-3205_Dec12)     Dec-13       Secondary Standards     ID #     Check Date (in house)     Scheduled Check       Power sensor HP 8481A     MY41092317     18-Oct-02 (in house check Oct-11)     In house check: Oct-13       RF generator R&S SMT-06     100005     04-Aug-99 (in house check Oct-11)     In house check: Oct-13       Network Analyzer HP 8753E     US37390585 S4208     18-Oct-01 (in house check Oct-12)     In house check: Oct-13       Catibrated by:     Left Klysner     Laboratory Technician     Signature		Calibration Equipment use	id (M&TE critical for calibration)			
Power sensor HP 8481A     MY41092317     18-Oct-02 (in house check Oct-11)     In house check: Oct-13       RF generator R&S SMT-06     100005     04-Aug-99 (in house check Oct-11)     In house check: Oct-13       Network Analyzer HP 8753E     US37390585 S4206     18-Oct-01 (in house check Oct-12)     In house check: Oct-13       Name     Function     Signature       Calibrated by:     Leff Klysner     Laboratory Technician		Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenual Type-N mismatch combina Reference Probe ES3DV3	GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327 I SN: 3205	01-Nov-12 (No. 217-01840) 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)	Oct-13 Oct-13 Apr-13 Apr-13 Dec-13	
Calibrated by: Leif Klysner Laboratory Technician		Power sensor HP 8481A RF generator R&S SMT-0	MY41092317 6 100005	18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	In house check: Oct-13 In house check: Oct-13	
Approved by Ketia Polynic Tachnical Mananar		Calibrated by:	Leif Klysner	Laboratory Technician	Signature Signature	
Approved by: Radia Postovic reclanical Manager (6.5.1.5.1.5.1.5.1.5.1.5.1.5.1.5.1.5.1.5.		Approved by:	Katja Pokovic	Technical Manager	Job RG	

Certificate No: D750V3-1021\_Jan13

Page 1 of 6

Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	July 12 – October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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



S Schweizerischer Kalibrierdienst C Service suisse d'étalonnage

Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

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

Document

#### Glossary:

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

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

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

#### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

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

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: D750V3-1021\_Jan13

Page 2 of 6

👯 BlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartphor eport	ne Model	Page <b>26(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

#### 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	Cherry Mills
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	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 <sup>3</sup> (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 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	1.38 W/kg

Certificate No: D750V3-1021\_Jan13

Page 3 of 6

#### Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.7 Ω - 0.2 jΩ
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-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 solderod 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

#### 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

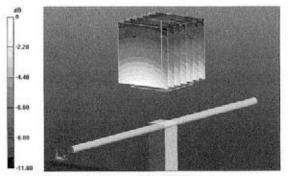
Communication System: CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz;  $\sigma$  = 0.89 S/m;  $\epsilon_r$  = 41.4;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.28, 6.28, 6.28); 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 = 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



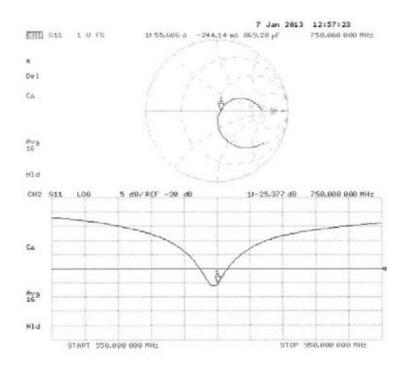
0 dB = 2.47 W/kg = 3.93 dBW/kg

Certificate No: D750V3-1021\_Jan13

Page 5 of 6

SlackBerry		Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>29(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

Impedance Measurement Plot for Head TSL



Certificate No: D750V3-1021\_Jan13

Page 6 of 6

SlackBerry		Appendix D for the RFV121LW SAR I	e BlackBerry® Smartpho Report	one Model	Page <b>30(61)</b>
w Becker	Dates of Test July 12 -	- October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
			17		
Se	alibration Labora chmid & Partner Engineering AG vghausstrasse 43, 8004 2			Service suisse d'étalonnage Servizio svizzero di taratura	
Th		reditation Service (SAS) ervice is one of the signatories the recognition of calibration of	to the EA	n No.: SCS 108	
Ch	lient RTS (RIM T	esting Services)	Certificate N	16: D835V2-446_Jan13	設定
C	ALIBRATION	N CERTIFICATE		的人物自然的自然的自然	
0	Dbject	D835V2 - SN: 446	<ul> <li>Malapasa di Nici Sector</li> </ul>		
C	alibration procedure(s)	QA CAL-05.v9 Calibration procee	lure for dipole validation kits ab	ove 700 MHz	
c	alibration date:	January 07, 2013	Activities and the second s		
m	his calibration certificate d	ocuments the traceability to natio	nal standards, which realize the physical u	nits of measurements (SI).	
דד דד או	his calibration certificate d he measurements and the ill calibrations have been o	ocuments the traceability to natic uncertainties with confidence pr onducted in the closed laboratory	nal standards, which realize the physical u	nits of measurements (SI). Ind are part of the certificate.	
דד דד או	his calibration certificate d he measurements and the ill calibrations have been o	ocuments the traceability to natic uncertainties with confidence pr	nal standards, which realize the physical u bability are given on the following pages a	nits of measurements (SI). Ind are part of the certificate.	
TT AV C	his calibration certificate d he measurements and the ul calibrations have been o calibration Equipment used frimary Standards	ocuments the traceability to natio uncertainties with confidence pri onducted in the closed laboratory I (M&TE critical for calibration)	nal standards, which realize the physical u sbability are given on the following pages a facility: environment temperature (22 ± 3) Cal Date (Certificate No.)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration	
TT TT AI C PI	his calibration certificate of he measurements and the ull calibrations have been of calibration Equipment used himary Standards hower meter EPM-442A	ocuments the traceability to natio uncertainties with confidence pro onducted in the closed laboratory I (M&TE critical for calibration)	nal standards, which realize the physical u obability are given on the following pages a facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640)	nits of measurements (SI). and are part of the certificate. *C and humidity < 70%. Scheduled Calibration Oct-13	
TT A C Pi Pi Pi	his calibration certificate d he measurements and the ul calibrations have been o calibration Equipment used frimary Standards	ocuments the traceability to natio uncertainties with confidence pri onducted in the closed laboratory I (M&TE critical for calibration)	nal standards, which realize the physical u sbability are given on the following pages a facility: environment temperature (22 ± 3) Cal Date (Certificate No.)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration	
	his calibration certificate of he measurements and the ull calibrations have been of calibration Equipment used himary Standards hower meter EPM-442A hower sensor HP B4B1A	ocuments the traceability to natio uncertainties with confidence pro- onducted in the closed laboratory (M&TE critical for calibration) ID # GB37480704 US37292783 r SN: 5058 (20k)	nal standards, which realize the physical u bability are given on the following pages a reality: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13	
	his calibration certificate d he measurements and the ul calibrations have been o calibration Equipment used himary Standards Yower sensor HP 8481A Vower sensor HP 8481A Heference 20 dB Attenuator ype-N mismatch combinat Reference Probe ES3DV3	ocuments the traceability to natio uncertainties with confidence pri onducted in the closed laboratory I (M&TE critical for calibration) ID # GB37480704 US97292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 3205	nal standards, which realize the physical u sobility are given on the following pages a (facility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-3205_Dec12)	nits of measurements (SI). Ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13	
	his calibration certificate d he measurements and the ull calibrations have been o calibration Equipment used himary Standards Power meter EPM-442A Vower sensor HIP 9481A telerence 20 dB Attenuator ype-N mismatch combinat	ocuments the traceability to natio uncertainties with confidence pri- onducted in the closed laboratory (M&TE critical for calibration) 10 # 0837480704 US37292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327	nal standards, which realize the physical u bability are given on the following pages a reality: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13	
	his calibration certificate d he measurements and the ull calibrations have been o calibration Equipment used himary Standards hower meter EPM-442A hower sensor HP 9481A Reference 20 dB Attenuator hype-N mismatch combinat teleforence Probe ES3DV3 JAE4	ocuments the traceability to natio uncertainties with confidence pri onducted in the closed laboratory (M&TE critical for calibration) 10 # GB37480704 US37292783 f SN: 5047.3 / 06327 SN: 5047.3 / 06327 SN: 601	nal standards, which realize the physical u sbability are given on the following pages a facility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. 23-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Dec-13 Jan-13 Jan-13	
	his calibration certificate d he measurements and the ul calibrations have been o calibration Equipment used himary Standards Yower sensor HP 8481A Heference 20 dB Attenuator ype-N mismatch combinat Reference Probe ES3DV3	ocuments the traceability to natio uncertainties with confidence pri onducted in the closed laboratory I (M&TE critical for calibration) ID # GB37480704 US97292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 3205	nal standards, which realize the physical u sobility are given on the following pages a (facility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 28-Dec-12 (No. ES3-3205_Dec12)	nits of measurements (SI). Ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13	
	his calibration certificate d he measurements and the calibration Equipment used minary Standards 'ower meter EPM-442A 'ower sensor HP 8481A Reference 20 dB Attenuator ype-N mismatch combinat leference Probe ES3DV3 DAE4 Secondary Standards	ocuments the traceability to natio uncertainties with confidence pri- onducted in the closed laboratory (M&TE critical for calibration) ID # GB37480704 US37292783 f SN: 5058 (20k) ion SN: 5058 (20k)	nal standards, which realize the physical u coability are given on the following pages a racility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house)	nits of measurements (SI). Ind are part of the certificate. *C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check	
	his calibration certificate d he measurements and the ull calibrations have been o calibration Equipment used himary Standards Yower sensor HP 9481A Reference 20 dB Attenuator ype-N mismatch combinat leference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 9481A	ocuments the traceability to natio uncertainties with confidence pri- onducted in the closed laboratory (M&TE critical for calibration) 10 # 0837480704 US97292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 5055 SN: 601 ID # MY41092317 100005	nal standards, which realize the physical u bability are given on the following pages a racility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-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 Date (in house) 18-Oct-02 (in house check Oct-11)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%, Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Jun-13 Scheduled Check In house check: Oct-13	
	his calibration certificate d he measurements and the ull calibrations have been o calibration Equipment used himary Standards Power sensor HP 9481A telerence 20 dB Attenuator ype-N mismatch combinat telerence Probe ES3DV3 JAE4 Secondary Standards Power sensor HP 9481A E generator R&S SMT-06	ocuments the traceability to natio uncertainties with confidence pri- onducted in the closed laboratory (M&TE critical for calibration) 10 # 0837480704 US97292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 5055 SN: 601 ID # MY41092317 100005	nal standards, which realize the physical u bability are given on the following pages a reality: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_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)	nits of measurements (SI). Ind are part of the certificate. *C and humidity < 70%, Certification Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13	
TIT A C P P P P R T T R D S P R N	his calibration certificate d he measurements and the ull calibrations have been o calibration Equipment used himary Standards Power sensor HP 9481A telerence 20 dB Attenuator ype-N mismatch combinat telerence Probe ES3DV3 JAE4 Secondary Standards Power sensor HP 9481A E generator R&S SMT-06	ocuments the traceability to natio uncertainties with confidence per onducted in the closed laboratory (M&TE critical for calibration) ID # GB37490704 US37292783 f SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # ID # MY41092317 100005 E US37390595 S4206	nal standards, which realize the physical u coability are given on the following pages a racility: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01633) 28-Dec-12 (No. ES3-3205_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-12)	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13	
TT A O P P P P R T B D S P R N C	his calibration certificate d he measurements and the calibration Equipment used vimary Standards 'ower meter EPM-442A 'ower sensor HP 8481A Reference 20 dB Attenuator ype-N mismatch combinat leference Probe ES3DV3 bAE4 Secondary Standards 'ower sensor HP 8481A BF generator R&S SMT-06 Reference R&S SMT-06	ocuments the traceability to natio uncertainties with confidence pro- onducted in the closed laboratory (M&TE critical for calibration) 10 # (GB37480704 US37292783 r SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 5058 (20k) ion SN: 5047.3 / 06327 SN: 3205 SN: 601 1D # MV41092317 100005 E US37390585 S4206 Name	nal standards, which realize the physical u bability are given on the following pages a facility: environment temperature (22 ± 3) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01633) 28-Dec-12 (No. 247-01533) 28-Dec-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-12) Function	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13	
TIT A C PP P P R T R D S P R N C A	his calibration certificate d he measurements and the calibration Equipment used vimary Standards 'ower smeter EPM-442A 'ower smoor HP 8481A Reference 20 dB Attenuator ype-N mismatch combinat leference 20 dB Attenuator ype-N mismatch combinat leference Probe ES3DV3 DAE4 Secondary Standards 'ower sensor HP 8481A E-generator R&S SMT-06 Retwork Analyzer HP 87538 Calibrated by:	ocuments the traceability to natio uncertainties with confidence pri- onducted in the closed laboratory (M&TE critical for calibration) ID # GB37490704 US37292783 r SN: 5058 (20k) ion SN: 5058 (20k) ion SN: 5058 (20k) SN: 5058 (20k) ID # ID # ID # ID # MV41092317 100005 EUS37390585 S4206 Name Leff Klysner Katja Pokovic	nal standards, which realize the physical u coability are given on the following pages a reality: environment temperature (22 ± 3) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. 2017-01533) 28-Dec-12	nits of measurements (SI). ind are part of the certificate. *C and humidity < 70%. <u>Scheduled Calibration</u> Oct-13 Oct-13 Apr-13 Apr-13 Jun-13 <u>Scheduled Check</u> In house check: Oct-13 In house check: Oct-13 In house check: Oct-13 In house check: Oct-13 Signature	

This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBerry

Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	July 12 – October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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



- S Schweizerischer Kalibrierdienst
- C Service suisse d'étaionnage
- Servizio svizzero di taratura Servizio Calibration Somios
- 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

Document

#### Glossary:

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

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

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

#### Additional Documentation:

d) DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

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

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: D835V2-446\_Jan13

Page 2 of 6

SlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartphon Ceport	e Model	Page <b>32(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

#### 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 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.92 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	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>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	1.55 W/kg

Certificate No: D835V2-446\_Jan13

Page 3 of 6

#### 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 "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

Certificate No: D835V2-446\_Jan13

Page 4 of 6

#### **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

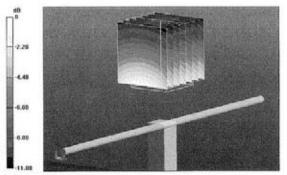
Communication System: CW; Frequency: 835 MHz Medium parameters used: f = 835 MHz;  $\sigma = 0.92$  S/m;  $\epsilon_r = 42$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.05, 6.05, 6.05); 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



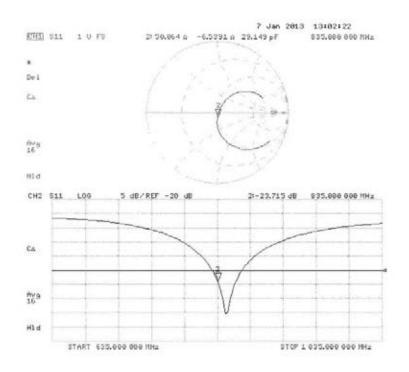
0 dB = 2.79 W/kg = 4.46 dBW/kg

Certificate No: D835V2-446\_Jan13

Page 5 of 6

😳 BlackBen	y	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>35(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446\_Jan13

Page 6 of 6

: BlackBe		Appendix D for the RFV121LW SAR I	e BlackBerry® Smartpho Report	one Model	Page 36(61)
<sup>ata</sup> ew Becker	Dates of Test	October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
	000 22				
Schn	oration Labora nid & Partner gineering AG ausstrasse 43, 8004 z		NAC MRA (Q T Z)	S Schweizerischer Kalibrierdienst Service suisse d'étaionnage Servizio svizzero di taratura S wiss Calibration Service	
The Sw	wiss Accreditation Se	editation Service (SAS) rvice is one of the signatories the recognition of calibration	a to the EA	on No.: SCS 108	
Client	RTS (RIM T	esting Services)	Certificate	No: D1800V2-2d020_Jan13	
CA	LIBRATION	CERTIFICATE	and all the second as a few		
Object		D1800V2 - SN: 20	d020		
Calibra	ation procedure(s)	QA CAL-05.v9 Calibration proces	dure for dipole validation kits at	bove 700 MHz	
Calibra	ation vistar				
	and date.	January 09, 2013	25.0 B 1825-33796		
This ca	alibration certificate do	cuments the traceability to natic	onal standards, which realize the physical r obability are given on the following pages i		
This of The m All cali	alibration certificate do leasurements and the ibrations have been co	cuments the traceability to natio uncertainties with confidence pr inducted in the closed laborator	onal standards, which realize the physical t	and are part of the certificate.	
This cr The m All cali Calibra	alibration certificate do leasurements and the iterations have been co stion Equipment used	cuments the traceability to natio uncertainties with confidence pr inducted in the closed laborator (M&TE critical for calibration)	onal standards, which realize the physical obability are given on the following pages (	and are part of the certificate. )°C and humidity < 70%.	
This or The m All cali Calibra Primar Power Refere Type-N Refere	alibration certificate do leasurements and the librations have been co ation Equipment used of ry Standards mater EPM-142A rsensor HP 6401A srice 20 dB Attenuator N mismatch combinatik snoce Probe ES3DV3	cuments the traceability to natio uncertainties with confidence pr inducted in the closed laboratory (M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5058 (20k) on SN: 5058 (20k) SN: 5058 (20k) SN: 5058 (20k)	onal standards, which realize the physical of obability are given on the following pages a y facility: environment temperature (22 ± 3 	and are part of the certificate. )"C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Dec-13	
This co The mu All calibro Calibro Power Power Refere Type-N Refere DAE4	alibration certificate do leasurements and the i ibrations have been co ation Equipment used i roter EPM-442A sensor HP 8401A since 20 dB Attenuator N mismatch combinatik mice Probe ES3DV3	cuments the traceability to natio uncertainties with confidence pr inducted in the closed laboratory (M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5068 (20k) on SN: 5047.3 / 06327 SN: 3205 SN: 601	onal standards, which realize the physical of obability are given on the following pages a y facility: environment temperature (Z2 ± 3 	and are part of the certificate. y"C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13	
This or The mi All cali Galibro Power Refere DAE4 Secon Power Refere DAE4	alibration certificate do leasurements and the librations have been co ation Equipment used of ry Standards mater EPM-142A rsensor HP 6401A srice 20 dB Attenuator N mismatch combinatik snoce Probe ES3DV3	cuments the traceability to natio uncertainties with confidence prinducted in the closed laborator (M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5058 (20k) on SN: 5058 (20k) on SN: 5058 (20k) SN: 5059 (20k) ID # ID # ID # ID # ID # ID # ID # ID #	onal standards, which realize the physical of obability are given on the following pages a y facility: environment temperature (22 ± 3 	and are part of the certificate. )"C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Dec-13	
This of The mi All calibra Primar Power Refere DAE4 Secon Power RF gef	alibration certificate do leasurements and the iterations have been co ation Equipment used of ry Standards meter EPM-142A rice 20 dB Attenuator N mismatch combination more Probe ES30V3 dary Standards sensor HP 8481A nerator R8S SMT-06	cuments the traceability to natio uncertainties with confidence prinducted in the closed laborator (M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5058 (20k) on SN: 5058 (20k) on SN: 5058 (20k) SN: 5059 (20k) ID # ID # ID # ID # ID # ID # ID # ID #	onal standards, which realize the physical of obability are given on the following pages a y facility: environment temperature (22 ± 3 	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13	9
This or The mi All cali Galibra Power Power Refere DAE4 Secon Power RF ger Networ	alibration certificate do leasurements and the r ibrations have been co ation Equipment used of ry Standards meter EPM-442A sensor HP 6401A ence 20 dB Attenuator N mismatch combination mer Probe ES3DV3 dary Standards sensor HP 8481A nerator R&S SMT-06 rk Analyzer HP 8753E	cuments the traceability to natik uncertainties with confidence pr inducted in the closed laborator (M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5068 (20k) on SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	onal standards, which realize the physical o obability are given on the following pages a y facility: environment temperature (22 ± 3 D1-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01533) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) D4-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12) Function	and are part of the certificate. y°C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-13	9

SlackBerry

# Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report

Author Data Dates of Test Test Report No	FCC ID:
Andrew Becker July 12 – October 16, 2013 RTS-6046-1310-2	25 L6ARFV120LW

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

Document

## Glossary:

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

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

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

#### Additional Documentation:

d) DASY4/5 System Handbook

# Methods Applied and Interpretation of Parameters:

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

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\_Jan13

Page 2 of 6

👯 BlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartphor eport	ne Model	Page <b>38(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

#### 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	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 mho/m	
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.38 mho/m ± 6 9	
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	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 <sup>2</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>a</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	5.06 W/kg

Certificate No: D1800V2-2d020\_Jan13

Page 3 of 6

#### Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.2 Ω - 8.3 μΩ		
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 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	September 07, 2001	

Certificate No: D1800V2-2d020\_Jan13

Page 4 of 6

# 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

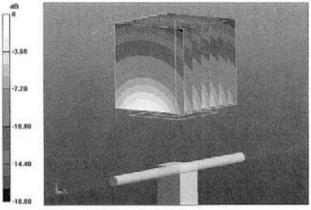
Communication System: CW; Frequency: 1800 MHz Medium parameters used: f = 1800 MHz;  $\sigma = 1.38$  S/m;  $\epsilon_r = 38.9$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(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



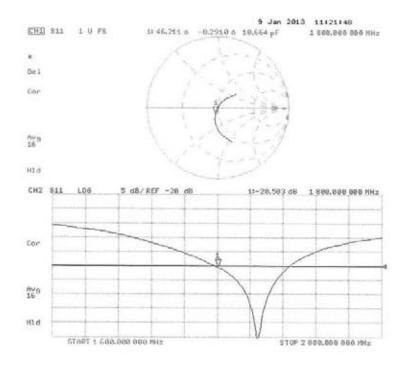
0 dB = 11.8 W/kg = 10.72 dBW/kg

Certificate No: D1800V2-2d020\_Jan13

Page 5 of 6

🚟 BlackBen	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 41(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

Impedance Measurement Plot for Head TSL



Certificate No: D1800V2-2d020\_Jan13

Page 6 of 6

SlackBerry		Appendix D for the RFV121LW SAR H	e BlackBerry® Smartpho Report	one Model	Page 42(61)
ew Becker	Dates of Test	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
Ju Decker	Uny 12	000000000000000000000000000000000000000	KII 0010 1010 20		
Sc	libration Labor hmid & Partner Engineering AG ghausstrasse 43, 8004		Nag-MBA (g V z)	Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Galibration Service	
The	e Swiss Accreditation 1	creditation Service (SAS) Service is one of the signatories r the recognition of calibration of	to the EA	on No.: SCS 108	
Clie		Testing Services)		No: D1900V2-545_Jan13	_
-		N CERTIFICATE			-
Ot	bject	D1900V2 - SN: 54	15 March Strategy and Strategy		
Ca	alibration procedure(s)	QA CAL-05.v9 Calibration proces	dure for dipole validation kits a	bove 700 MHz	
Ca	alibration date:	January 09, 2013			
Th	iis calibration certificate	documents the traceability to natio	onal standards, which realize the physical obability are given on the following pages		
דר זה	is calibration certificate te measurements and th	documents the traceability to natio	al standards, which realize the physical	and are part of the certificate.	
Th Th All	iis calibration certificate he measurements and th I calibrations have been	documents the traceability to natio	anal standards, which realize the physical obability are given on the following pages	and are part of the certificate.	
Th Th All Ca Prei	iis calibration certificate te measurements and th I calibrations have been alibration Equipment use timary Standards	documents the traceability to nation re uncertainties with confidence pr conducted in the closed laborator red (M&TE critical for calibration)	onal standards, which realize the physical obability are given on the following pages y facility: environment temperature (22 ± 3 Cal Date (Certificate No.)	and are part of the certificate. 8)°C and humidity < 70%. Scheduled Calibration	
Th Th All Ca Pro	is calibration certificate te méasurements and th I calibrations have been alibration Equipment use timary Standards zwar matar EPM-442A	documents the traceability to nation is uncertainties with confidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704	chal standards, which realize the physical obability are given on the following pages y facility: environment temperature (22 ± 2 Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640)	and are part of the certificate. b)*C and humidity < 70%. <u>Scheduled Calibration</u> Oct-13	
Th Th All Ca Pro Po	iis calibration certificate te measurements and th I calibrations have been alibration Equipment use timary Standards	documents the traceability to nation is uncertainties with confidence pro- conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783	onal standards, which realize the physical obability are given on the following pages y facility: environment temperature (22 ± 3 Cal Date (Certificate No.)	and are part of the certificate. 8)°C and humidity < 70%. Scheduled Calibration	
Th Th All Ca Pr Po Po Re Ty	tis calibration certificate the measurements and the calibration Equipment use alibration Equipment use timary Standards ower sensor HP 8481A eference 20 dB Attenuat ppe-N mismatch combin	documents the traceability to nation is uncertainties with confidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533)	and are part of the certificate. b)*C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13	
Th Th All Ca Pro Pro Re Ty Re	tis calibration certificate the measurements and th I calibrations have been alibration Equipment use timary Standards ower sensor HP 8481A efference 20 dB Attenuat spe-N mismatch combini- oforence Probe ES3DV3	documents the traceability to nativ is uncertainties with confidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047 3 / 06327 s SN: 3205	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 26-Dec-12 (No. ES3-3205_Dec12)	and are part of the certificate. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13	
Th Th All Ca Pro Pro Re Ty Re	tis calibration certificate the measurements and the calibration Equipment use alibration Equipment use timary Standards ower sensor HP 8481A eference 20 dB Attenuat ppe-N mismatch combin	documents the traceability to nation is uncertainties with confidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533)	and are part of the certificate. b)*C and humidity < 70%. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13	
Th Th All Ca Pri Po Re Ty Re DJ	tis calibration certificate te measurements and th I calibration Equipment use timary Standards were meter EPM-442A were sensor HP 8481A eference 20 dB Attenuat po-N mismatch combin eference Probe ES3DV3 AE4 econdary Standards	documents the traceability to nativ e uncertainties with contidence pr conducted in the closed laborator ed (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327 SN: 5055 SN: 601 ID #	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 26-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house)	and are part of the certificate. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check	
Th Th All Ca Pro Pro Re Ty Re DJ Se Pro	tis calibration certificate the measurements and the calibration Equipment use simary Standards ower meter EPM-442A owers sensor HP 8481A eference 20 dB Attenuat pe-N mismatch combini eference Probe ES3DV3 AE4 secondary Standards ower sensor HP 8481A	documents the traceability to nativ ie uncertainties with contidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327 is SN: 3205 SN: 601 ID # MY41092317	Cal Date (Certificate No.) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205, Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11)	and are part of the certificate. Scheduled Calibration Oct-13 Oct-13 Oct-13 Apr-13 Apr-13 Jun-13 Scheduled Check In house check: Oct-13	
Th Th All Ca Pro Pro Re Ty Re DJ Sa Fro RF	tis calibration certificate te measurements and th I calibration Equipment use timary Standards were meter EPM-442A were sensor HP 8481A eference 20 dB Attenuat po-N mismatch combin eference Probe ES3DV3 AE4 econdary Standards	documents the traceability to nation is uncertainties with confidence pr conducted in the closed laborator ind (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327 is SN: 3205 SN: 601 ID # MY41082317 6 100005	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01630) 27-Mar-12 (No. 217-01533) 26-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house)	and are part of the certificate. Scheduled Calibration Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check	
Th Th All Ca Pro Pro Re Ty Re DJ Sa Fro RF	tis calibration certificate the measurements and the calibration Equipment use simary Standards ower sensor HP 8481A eference 20 dB Attenuat pe-N mismatch combine eference Probe ES3DV3 AE4 econdary Standards ower sensor HP 8481A F generator R&S SMT-0	documents the traceability to nativ is uncertainties with confidence pr conducted in the closed laborator id (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047 3 / 06327 i SN: 5058 (20k) ation SN: 5047 3 / 06327 i SN: 601 ID # ID # MY41092317 6 100005 3E US37390585 S4206	Cal Date (Certificate No.) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01630) 27-Mar-12 (No. 217-01633) 26-Dec-12 (No. 217-01533) 26-Dec-12 (No. ES3.3206_Dec12) 27.Jun-12 (No. DAE4-601_Jun12) Check Date (in house check Oct-11) 04-Aug-99 (in house check Oct-12)	and are part of the certificate. Scheduled Calibration 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	
Th Th All Ca Pri Po Re Ty Re DJ Sa Fo RF RF Ne	tis calibration certificate the measurements and the calibration Equipment use simary Standards ower sensor HP 8481A eference 20 dB Attenuat pe-N mismatch combine eference Probe ES3DV3 AE4 econdary Standards ower sensor HP 8481A F generator R&S SMT-0	documents the traceability to nation is uncertainties with confidence pr conducted in the closed laborator ind (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5047.3 / 06327 is SN: 3205 SN: 601 ID # MY41082317 6 100005	Cal Date (Certificate No.) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01533) 26-Den-12 (No. ES3-3205_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)	and are part of the certificate. Scheduled Calibration Oct-13 Oct-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 Signature	
Th Th All Ca Pro Pro Re Ty Re DJ Sa Re RF Ne	tis calibration certificate te measurements and th I calibration Equipment use alibration Equipment use timary Standards were meter EPM-442A were sensor HP 8481A eference 20 dB Attenuat po-N mismatch combin eference Probe ES3DV3 AE4 econdary Standards over sensor HP 8481A F generator R&S SMT-0 etwork Analyzer HP 875	documents the traceability to nativ e uncertainties with contidence pr conducted in the closed laborator ed (M&TE critical for calibration) ID # GB37480704 US37292783 or SN: 5058 (20k) ation SN: 5058 (20k) ation SN: 5047 3 / 06327 3 SN: 601 ID # ID # MY41092317 6 100005 3E US37390585 S4206 Name	Cal Date (Certificate No.) Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) 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. 217-01533) 28-Dec-12 (No. ES3.3205, 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-12) Function	and are part of the certificate. Scheduled Calibration 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	19

This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBerry

Author Data	Dates of Test	Test Report No	FCC ID:
Andrew Becker	July 12 – October 16, 2013	RTS-6046-1310-25	L6ARFV120LW

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



S Schweizerischer Kalibrierdienst C Service suisse d'étalonnage

Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

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

Document

#### Glossary:

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

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

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

# Additional Documentation:

d) DASY4/5 System Handbook

# Methods Applied and Interpretation of Parameters:

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

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

🚟 BlackBerr	y	Appendix D for the RFV121LW SAR R	Page <b>44(61)</b>		
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

# Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.4 ± 6 %	1.38 mho/m ± 8 %
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	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>3</sup> (10 g) of Head TSL	condition	
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	5.26 W/kg

Certificate No: D1900V2-545\_Jan13

Page 3 of 6

#### Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.0 Ω + 1.7 jΩ	
Return Loss	- 34.3 dB	

#### General Antenna Parameters and Design

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 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: D1900V2-545\_Jan13

Page 4 of 6

## **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

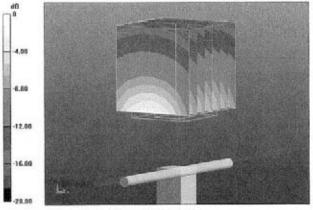
Communication System: CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz;  $\sigma = 1.38$  S/m;  $\epsilon_r = 39.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(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



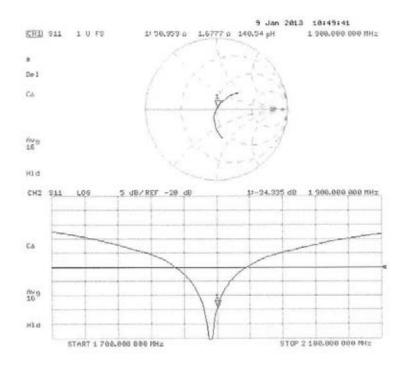
0 dB = 12.2 W/kg = 10.86 dBW/kg

Certificate No: D1900V2-545\_Jan13

Page 5 of 6

SlackBer	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>47(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545\_Jan13

Page 6 of 6

BlackBerry		Appendix D for the RFV121LW SAR F	e Model	Page 48(61)	
ew Becker	Dates of Test July 12 –	October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
		• •			
	Calibration Labo Schmid & Partne Engineering AG Zeughausstrasse 43, 800	1	Hac-MRA (g V z)	S Schweizerischer Kalibrierdiens Service suisse d'étalonnage Servizio svizzero di taratura S swiss Calibration Service	st
	The Swiss Accreditation	Accreditation Service (SAS) a Service is one of the signato for the recognition of calibration	ries to the EA	ion No.: SCS 108	
	Client RTS (RIN	Testing Services)	Certificate	No: D2450V2-747_Nov11	1975
	CALIBRATIC	ON CERTIFICAT	E		
	Object	D2450V2 - SN	747 - 20 - 20 - 20 - 20		
	Calibration procedure(s)	QA CAL-05.v8 Calibration pro	cedure for dipole validation kits a	bove 700 MHz	
	Calibration date:		2011		
	This calibration certificat The measurements and	November 09, e documents the traceability to r the uncertainties with confidence	2011 national standards, which realize the physical e probability are given on the following pages	and are part of the certificate.	
	This calibration certificat The measurements and All calibrations have bee	November 09, e documents the traceability to r the uncertainties with confidence	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 2	and are part of the certificate.	
	This calibration certificat The measurements and All calibrations have bee	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 2	and are part of the certificate.	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 n)	s and are part of the certificate. 3)°C and humidity < 70%.	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu	November 09, e documents the traceability to r the uncertainties with confidence in conducted in the closed laboration sed (M&TE critical for calibration ID # GB37490704 US37292783 ator SN: 5086 (20g)	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 n) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	3 and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37292783 stor SN: 5086 (209) nation SN: 5047.2 / 06327	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 n) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01371)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37292763 ator SN: 5086 (20g) nation SN: 5047.2 / 06327	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 n) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	3 and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment us Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DV	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37490704 US37292783 ator SN: 5066 (20g) nation SN: 5067.2 / 06327 /3 SN: 3205	2011 hational standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 )) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. ES3-3205_Apr11)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment us Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DN DAE4	November 09, e documents the traceability to r the uncertainties with confidence in conducted in the closed labora- sed (M&TE critical for calibration ID # GB37480704 US37292783 short SN: 5086 (20g) nation SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. 23-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DV DAE4 Secondary Standards	November 09, November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37292763 stor SN: 5086 (20g) nation SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 )) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01371) 29-Apr-11 (No. DAE4-601_Jul11) Check Date (in house)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DV DAE4 Secondary Standards Power sensor HP 8481A	November 09, November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37292783 sh: 5066 (20g) nation SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # ID # MY41092317 06 100005	2011 hational standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 )) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01371) 29-Mar-11 (No. E33-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment us Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DN DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT	November 09, November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37292783 sh: 5066 (20g) nation SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # ID # MY41092317 06 100005	2011 hational standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 )) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01371) 29-Mar-11 (No. ES3-3205_Apr11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11)	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13	
	This calibration certificat The measurements and All calibrations have bee Calibration Equipment u Primary Standards Power sensor HP 8481A Reference 20 dB Attenu Type-N mismatch combi Reference Probe ES3DV DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT- Network Analyzer HP 87	November 09, e documents the traceability to r the uncertainties with confidence n conducted in the closed labora sed (M&TE critical for calibration ID # GB37480704 US37282783 ator SN: 5086 (209) nation SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 06 100005 53E US37390585 S420 Name	2011 national standards, which realize the physical e probability are given on the following pages atory facility: environment temperature (22 ± 3 atory facility: environment temperature (22 ± 3 cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 217-01368) 7 29-Mar-11 (No. 283-3205_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) 6 18-Oct-01 (in house check Oct-11) Function	s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-13	

This report shall <u>NOT</u> be reproduced except in full without the written consent of BlackBerry RTS Copyright 2005-2013, BlackBerry RTS, a division of BlackBerry Limited

SlackBerry		Document Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report					Page <b>49(61)</b>
Author Data Andrew Becker	Dates of Tes July 12	– October 16, 2013	Test Report No RTS-6046-2	1310-25		FCC ID: L6ARFV120LW	
	1774) 1774						
Sc	libration La hmid & Partr Engineering / ghausstrasse 43,	ner		SWISS CR. DR. NO	s C S	Schweizerischer Kalibrier Service suisse d'étalonna Servizio svizzero di taratu Swiss Calibration Service	ge

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:

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

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

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

#### Additional Documentation:

d) DASY4/5 System Handbook

# Methods Applied and Interpretation of Parameters:

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

Certificate No: D2450V2-747\_Nov11

Page 2 of 6

SlackBerr	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page <b>50(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

### **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 averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	6.39 mW / g

Certificate No: D2450V2-747\_Nov11

Page 3 of 6

\_\_\_\_\_

#### Appendix

#### Antenna Parameters with Head TSL

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

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

Electrical Delay (and direction)	1.161 ns
Electrical Delay (one direction)	1.101 hs

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

#### **Additional EUT Data**

feedpoint may be damaged.

Manufactured by	SPEAG		
Manufactured on	December 01, 2003		

Certificate No: D2450V2-747\_Nov11

Page 4 of 6

#### **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

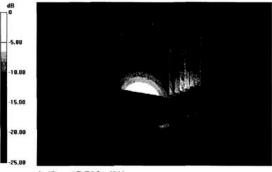
Communication System: CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz;  $\sigma = 1.84$  mho/m;  $\varepsilon_r = 37.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



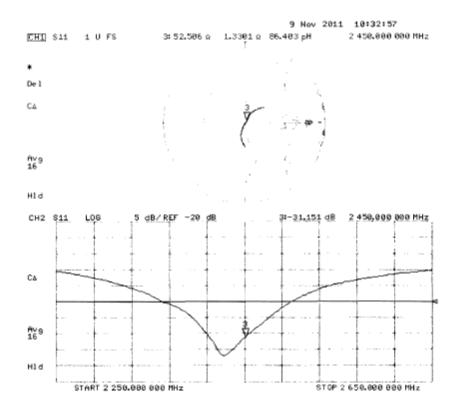
 $0 \, dB = 17.780 \, mW/g$ 

Certificate No: D2450V2-747\_Nov11

Page 5 of 6

SlackBerr	у			Page <b>53(61)</b>	
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-747\_Nov11

Page 6 of 6

					Page 54(61)
Becker	Dates of Test July 12	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
	Accredited by the Swise	er		S Schweizerischer Kallbrierdier C Service suisse d'étalonnage Servizio svizzero di taratura S wiss Calibration Service tion No.: SCS 108	nst
	Multilateral Agreemen	t for the recognition of calibratio	on certificates		
		M Testing Services)		No: D5GHzV2-1033_Nov1	
	CALIBRAT	ON CERTIFICAT	E	and the second states of the	da a
	Object	D5GHzV2 - SN	5 <b>1033</b> °	S To William Market States	
	Calibration procedure(	Calibration proc	cedure for dipole validation kits t	between 3-6 GHz	
		Selfer and a selfer	and the second	and the second	
			e	adalah da sa	
	Calibration date:		2011		
	This calibration certific	November 15, a		l units of measurements (SI).	
	This calibration certific The measurements an	November 15, 3 ate documents the traceability to n d the uncertainties with confidence	2011	units of measurements (\$1). s and are part of the certificate.	
	This calibration certific The measurements an All calibrations have be	November 15, 3 ate documents the traceability to n d the uncertainties with confidence	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ±	units of measurements (\$1). s and are part of the certificate.	
	This calibration certific The measurements an All calibrations have be Calibration Equipment	November 15, 3 ate documents the traceability to n d the uncertainties with confidence sen conducted in the closed labora	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ±	units of measurements (\$1). s and are part of the certificate.	
	This calibration certific The measurements an All calibrations have be	November 15, 3 ate documents the traceability to n d the uncertainties with confidence sen conducted in the closed labora used (M&TE critical for calibration ID # 2A GB37480704	2011 ational standards, which realize the physica a probability are given on the following pages story facility: environment temperature (22 ± )	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%.	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 8481	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # 2A GB37480704 IA US37292783	2011 ational standards, which realize the physica e probability are given on the following pages story facility: environment temperature (22 ± ) <u>Cal Date (Certificate No.)</u> 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451)	I units of measurements (\$1). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 943 Reference 20 dB Atten	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # A GB37480704 IA US37292783 suator SN: 5086 (20g)	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 8491 Reference 20 dB Atten Type-N mismatch com	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # 2A GB37480704 IA US37292783 Juator SN: 5086 (20g) bination SN: 5047.2 / 06327	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ± ) <u>Cal Date (Certificate No.)</u> 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371)	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. 3)°C and humidity < 70%. <u>Scheduled Calibration</u> Oct-12 Oct-12 Oct-12 Apr-12 Apr-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 943 Reference 20 dB Atten	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # 2A GB37480704 IA US37292783 Juator SN: 5086 (20g) bination SN: 5047.2 / 06327	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368)	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 8481 Reference 20 dB Atten Type-N mismatch com Reference Probe EX30 DAE4	November 15, 3 ate documents the traceability to n d the uncertainties with confidence are conducted in the closed labora used (M&TE critical for calibration UD # 2A GB37480704 IA US37292783 inator SN: 5086 (209) bination SN: 5047.2 / 06327 SN: 503 SN: 601	2011 ational standards, which realize the physical a probability are given on the following pages story facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11)	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Mar-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power sensor HP 8481 Reference 20 dB Atten Type-N mismatch com Reference Probe EX30	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # 2A GB37480704 IA US37292783 isotor SN: 5086 (209) bination SN: 5047.2 / 06327 SN: 503 SN: 601	2011 ational standards, which realize the physica e probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11)	l units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Jul-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 848 Reference 20 dB Atten Type-N mismatch com Reference Probe EX30 DAE4 Secondary Standards	November 15, 3 ate documents the traceability to n d the uncertainties with confidence een conducted in the closed labora used (M&TE critical for calibration ID # A GB37480704 IA US37292783 nuator SN: 5086 (20g) bination SN: 5047.2 / 06327 DV4 SN: 3503 SN: 601 ID # IA MY41092317	2011 ational standards, which realize the physical a probability are given on the following pages story facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. DAE4-601_Jul11) Check Date (in house)	I units of measurements (\$1). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Jul-12 Scheduled Check	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 843 Reference 20 dB Atten Type-N mismatch com Reference Probe EX30 DAE4 Secondary Standards Power sensor HP 8481	November 15, 3 ate documents the traceability to n d the uncertainties with confidence seen conducted in the closed labora used (M&TE critical for calibration ID # A GB37480704 IA US37292783 uator SN: 5086 (20g) bination SN: 5047.2.705327 DV4 SN: 3503 SN: 601 ID # IA MY41092317 T-06 100005	2011 ational standards, which realize the physica a probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. EX3-3503_Mar11) 04-Mar-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)	I units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Jul-12 Scheduled Check In house check: Oct-13	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 849: Reference 20 dB Atten Type-N mismatch com Reference Probe EX30 DAE4 Secondary Standards Power sensor HP 849 RF generator R&S SM	November 15, 3 ate documents the traceability to n d the uncertainties with confidence seen conducted in the closed labora used (M&TE critical for calibration ID # A GB37480704 IA US37292783 uator SN: 5086 (20g) bination SN: 5047.2.705327 DV4 SN: 3503 SN: 601 ID # IA MY41092317 T-06 100005	2011 ational standards, which realize the physica a probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. 217-01368) 29-Mar-11 (No. EX3-3503_Mar11) 04-Mar-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)	l units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 843 Reference 20 dB Atten Type-N mismatch com Reference Probe EX31 DAE4 Secondary Standards Power sensor HP 643 RF generator R&S SM Network Analyzer HP 8	November 15, 3         ate documents the traceability to n         d the uncertainties with confidence         seen conducted in the closed labora         used (M&TE critical for calibration         ID #         A       GB37480704         IA       US37292783         wator       SN: 5047.2.0 6327         DV4       SN: 5047.2.0 6327         DV4       SN: 3503         SN: 601       ID #         IA       MY41092317         Tr-06       100005         8753E       US37390585 S4206         Name         Dimce flae:	2011 ational standards, which realize the physica a probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. 217-01371) 04-Mar-11 (No. 2X3-3503_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) 5 18-Oct-01 (in house check Oct-11) Function	l units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-12	
	This calibration certific The measurements an All calibrations have be Calibration Equipment Primary Standards Power meter EPM-442 Power sensor HP 849: Reference 20 dB Atten Type-N mismatch com Reference Probe EX30 DAE4 Secondary Standards Power sensor HP 849 RF generator R&S SM Network Analyzer HP 6 Calibrated by:	November 15, 3         ate documents the traceability to n         d the uncertainties with confidence         seen conducted in the closed labora         used (M&TE critical for calibration         ID #         A       GB37480704         IA       US37292783         Nation       SN: 5046 (20g)         bination       SN: 5047 2 / 06327         DV4       SN: 3503         SN: 601       ID #         IA       MY41092317         T-06       100005         8753E       US37390585 S4206         Name         Dimee ilieu	2011 ational standards, which realize the physical a probability are given on the following pages tory facility: environment temperature (22 ± ) Cal Date (Certificate No.) 05-Oct-11 (No. 217-01451) 05-Oct-11 (No. 217-01451) 29-Mar-11 (No. 217-01371) 04-Mar-11 (No. 217-01371) 04-Mar-11 (No. EX3-3503_Mar11) 04-Jul-11 (No. EX3-3503_Mar11)	l units of measurements (SI). s and are part of the certificate. 3)°C and humidity < 70%. Scheduled Calibration Oct-12 Oct-12 Apr-12 Apr-12 Jul-12 Scheduled Check In house check: Oct-13 In house check: Oct-13 In house check: Oct-12	

A			pendix D for the BlackBerry® Smartphone Model 5 V121LW SAR Report		
uthor Data	Dates of Test	– October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
Inter Decker		- 00000110,2013	K15-0040-1010-25		
	Calibration Lat Schmid & Partn Engineering A Zeughausstrasse 43, 6	er	BCMEA REAL	S Schweizerischer Kalibrierdi C Service suisse d'étaionnage Servizio svizzero di taratura S Swiss Calibration Service	
	The Swiss Accreditati	s Accreditation Service (SAS) ion Service is one of the signat at for the recognition of calibrat		Accreditation No.: SCS 108	
	<b>Glossary:</b> TSL ConvF N/A	tissue simulating sensitivity in TSL not applicable or r	/ NORM x,y,z		
	Averaged Commun b) IEC 6220 devices u February c) Federal 0 "Evaluatii Electrom Portable Supplem	d Specific Absorption F ications Devices: Mea 09-1, "Procedure to me used in close proximity 2005 Communications Common of Compliance with FC agnetic Fields; Additio Devices with FCC Lim ent C (Edition 01-01) t	Rate (SAR) in the Human H surement Techniques", De easure the Specific Absorp to the ear (frequency rang mission Office of Engineer CC Guidelines for Human H nal Information for Evaluat its for Human Exposure to	ecember 2003 tion Rate (SAR) for hand-held	
	<ul> <li>Measure</li> </ul>		ner details are available fro	om the Validation Report at the lid at the frequency indicated.	
	point exa			h the spacer to position its fee n section, with the arms oriente	
	positione measure	d under the liquid filled	d phantom. The impedance ector to the feed point. The	ers are measured with the dipo e stated is transformed from th e Return Loss ensures low	
		Delay: One-way delay tainty required.	y between the SMA conne	ctor and the antenna feed poir	nt.
	<ul> <li>SAR mea</li> </ul>	asured: SAR measured	d at the stated antenna inp	out power.	
	<ul> <li>SAR non connecto</li> </ul>		sured, normalized to an inp	out power of 1 W at the antenn	a
	Connecto	ır.			

#### Measurement Conditions

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

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

#### Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

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

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

SAR averaged over 1 cm <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

1	The following parameters and calculations were applied.			
		Temperature	Permittivity	Γ
	Nominal Head TSL parameters	22.0 °C	35.6	Γ

# Nominal Head TSL parameters 22.0 °C 35.6 4.96 mho/m Measured Head TSL parameters (22.0 ± 0.2) °C 34.2 ± 6 % 4.75 mho/m ± 6 % Head TSL temperature change during test < 0.5 °C</th> --- ---

Conductivity

#### 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 averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 100 mW input power	2.50 mW / g

Certificate No: D5GHzV2-1033\_Nov11

Page 3 of 8

#### Head TSL parameters at 5800 MHz

	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)

Certificate No: D5GHzV2-1033\_Nov11

Page 4 of 8

# 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

Certificate No: D5GHzV2-1033\_Nov11

Page 5 of 8

#### **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/m<sup>3</sup>, Medium parameters used: f = 5500 MHz;  $\sigma = 4.75$  mho/m;  $\varepsilon_r = 34.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>, Medium parameters used: f = 5800 MHz;  $\sigma = 5.03$  mho/m;  $\varepsilon_r = 33.7$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

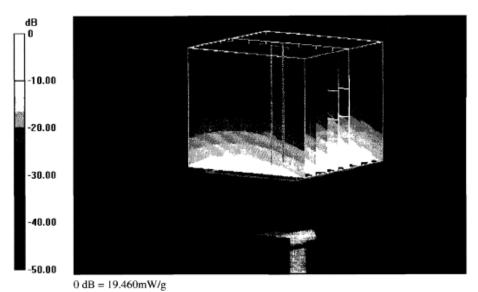
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 66.819 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 35.056 W/kg SAR(1 g) = 8.82 mW/g; SAR(10 g) = 2.5 mW/g Maximum value of SAR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

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

Certificate No: D5GHzV2-1033\_Nov11

Page 6 of 8

SlackBerry		Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report			Page <b>60(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	– October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

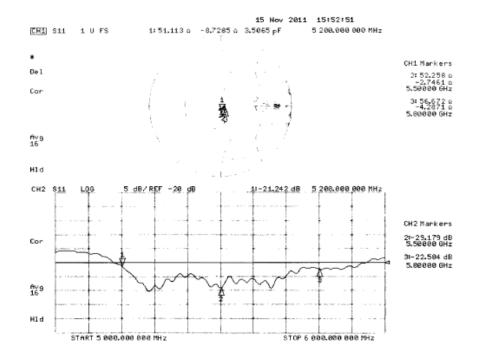


Certificate No: D5GHzV2-1033\_Nov11

Page 7 of 8

SlackBerry		Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report			Page <b>61(61)</b>
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

# Impedance Measurement Plot for Head TSL



Certificate No: D5GHzV2-1033\_Nov11

Page 8 of 8