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		-

∷ 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),					
	 a) IEEE Std 15 Absorption I Techniques b) IEC 62209- 	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					
	 NORMx,y,z NORMx,y,z uncertainty NORM(I)x,y implemente 	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 ² -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					
	 exposed by Sensor Offs 	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 4(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

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

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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) ²) ^A	1.29	1.19	1.31	± 10.1 %
DCP (mV) ⁸	100.5	101.5	99.9	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	С	D dB	VR mV	Unc ^t (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%.

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

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⁶ The uncertainties of NormX,Y,Z do not affect the E²-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) ^c	Relative Permittivity [#]	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

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. ⁷ At frequencies below 3 GHz, the validity of 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.

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

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

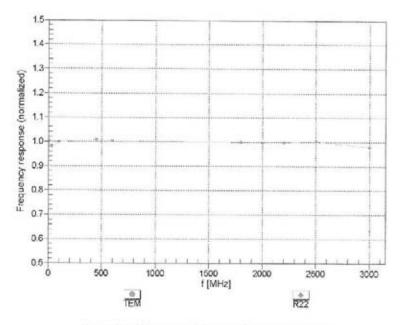
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*** BlackBerr	y	Appendix D for the RFV121LW SAR F	e BlackBerry® Smartpho Report	one Model	Page 8(61)
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ES3DV3- SN:3225

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

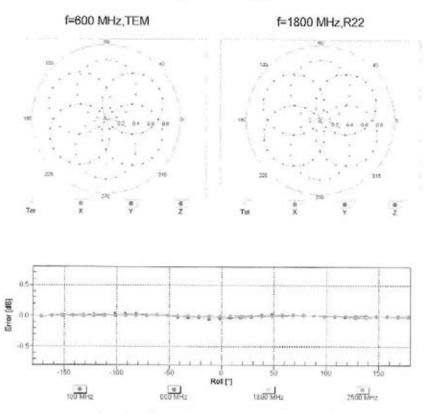
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SlackBern	y		ppendix D for the BlackBerry® Smartphone Model FV121LW SAR Report Test Report No FCC ID:		
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

E53DV3- SN:3225

January 10, 2013

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



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

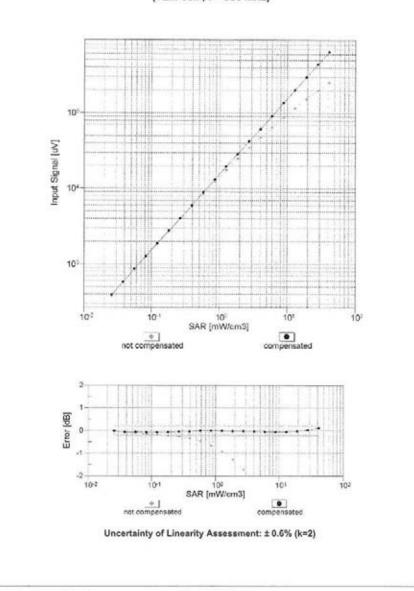
Certificate No: ES3-3225_Jan13

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SlackBerr		for the BlackBerry® Smartpho SAR Report	one Model	Page 10(61)			
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Andrew Becker	July 12 – October 16,						

ES3DV3- SN:3225

January 10, 2013



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

Certificate No: ES3-3225_Jan13

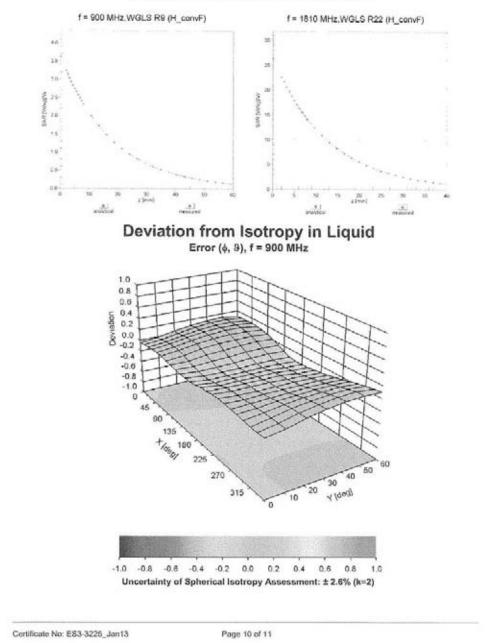
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😳 BlackBer	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 11(61)
Author Data	Dates of Test		Test Report No	FCC ID:	
Andrew Becker	July 12	- October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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ES3DV3- SN:3225
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January 10, 2013

Conversion Factor Assessment



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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

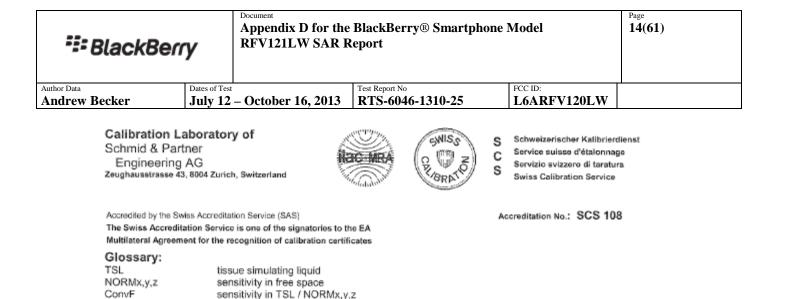
Certificate No: ES3-3225_Jan13

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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 ^{Zeughausstrasse}	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	
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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 E²-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.

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DCP

A, B, C, D

Polarization o

Polarization 8

CF

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Author Data	Dates of Test		Test Report No	FCC ID:			
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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!)

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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) ⁸	103.2	98.0	98.7	

Modulation Calibration Parameters

UID	Communication System Name		А	В	С	D	VR	Unc ^E
			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%.

- ^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).
 ⁸ Numerical linearization parameter: uncertainty not required.
 ⁴ Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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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) ^C	Relative Permittivity ^F	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

^c 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.
^F 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

¹ 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.

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EX3DV4- SN:3548

January 15, 2013

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

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

the ConvF uncertainty for indicated target tissue parameters.

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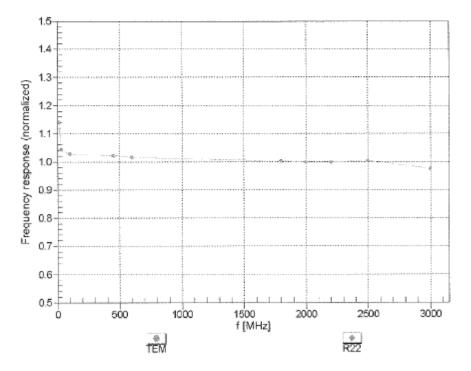
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EX3DV4-- SN:3548

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

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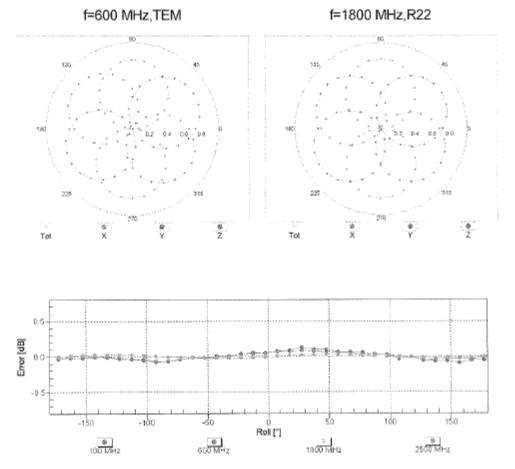
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Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$



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

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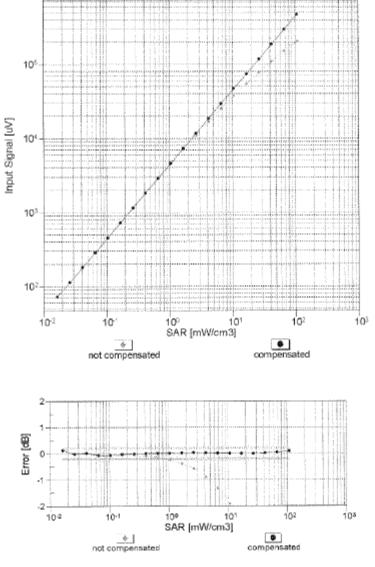
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EX3DV4- SN:3548

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

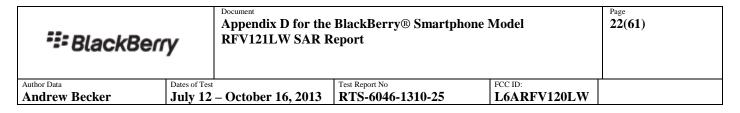


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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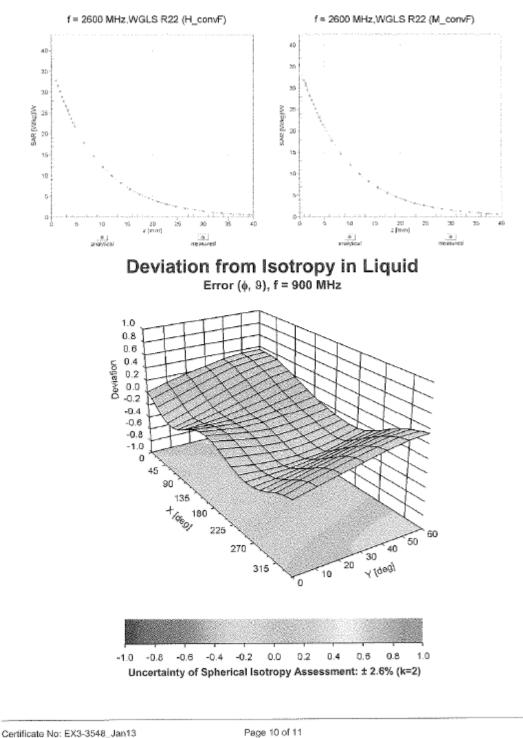
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EX3DV4-- SN:3548

January 15, 2013

Conversion Factor Assessment



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EX3DV4- SN:3548

January 15, 2013

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

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-72.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body 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

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<text></text>	BlackBerry		Appendix D for the RFV121LW SAR F	e BlackBerry® Smartpho Report	one Model	Page 24(61)
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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	
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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	
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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)			
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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	

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Andrew Becker	July 12 – October 16, 2013	RTS-6046-1310-25	L6ARFV120LW	

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



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Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 108

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

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

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👯 BlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartphor eport	ne Model	Page 26(61)
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 ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.46 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	1.38 W/kg

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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

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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

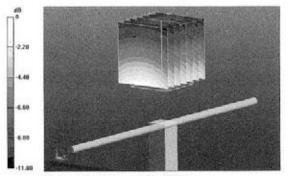
Communication System: CW; Frequency: 750 MHz Medium parameters used: f = 750 MHz; σ = 0.89 S/m; ϵ_r = 41.4; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



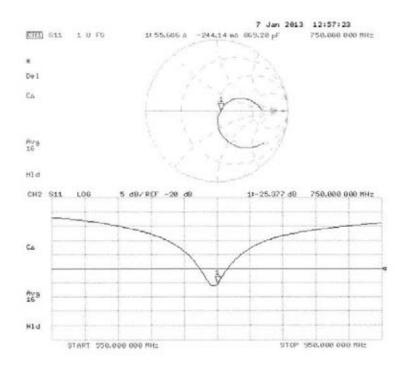
0 dB = 2.47 W/kg = 3.93 dBW/kg

Certificate No: D750V3-1021_Jan13

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SlackBerry		Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 29(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: D750V3-1021_Jan13

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SlackBerry		Appendix D for the RFV121LW SAR I	e BlackBerry® Smartpho Report	one Model	Page 30(61)
w Becker	Dates of Test July 12 -	- October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
			17		
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Th		reditation Service (SAS) ervice is one of the signatories the recognition of calibration of	to the EA	n No.: SCS 108	
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C	ALIBRATION	N CERTIFICATE		的人物自然的自然的自然	
0	Dbject	D835V2 - SN: 446	 Malapasa di Nici Sector 		
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).	
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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

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SlackBerr	у	Appendix D for the RFV121LW SAR R	BlackBerry® Smartphon Ceport	e Model	Page 32(61)
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 ³ (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 ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	1.55 W/kg

Certificate No: D835V2-446_Jan13

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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

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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

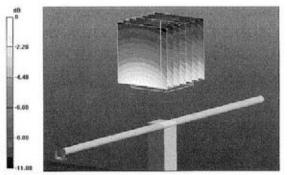
Communication System: CW; Frequency: 835 MHz Medium parameters used: f = 835 MHz; $\sigma = 0.92$ S/m; $\epsilon_r = 42$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



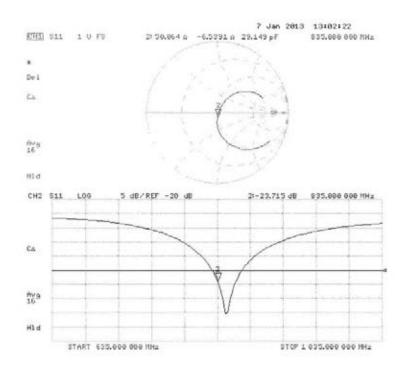
0 dB = 2.79 W/kg = 4.46 dBW/kg

Certificate No: D835V2-446_Jan13

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😳 BlackBen	y	Document Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 35(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: D835V2-446_Jan13

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: BlackBe		Appendix D for the RFV121LW SAR I	e BlackBerry® Smartpho Report	one Model	Page 36(61)
^{ata} ew Becker	Dates of Test	October 16, 2013	Test Report No RTS-6046-1310-25	FCC ID: L6ARFV120LW	
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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		
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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%.

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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 ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.61 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	38.5 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ² (10 g) of Head TSL	condition	
SAR averaged over 10 cm ^a (10 g) of Head TSL SAR measured	condition 250 mW input power	5.06 W/kg

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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

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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

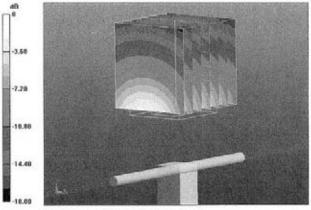
Communication System: CW; Frequency: 1800 MHz Medium parameters used: f = 1800 MHz; $\sigma = 1.38$ S/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



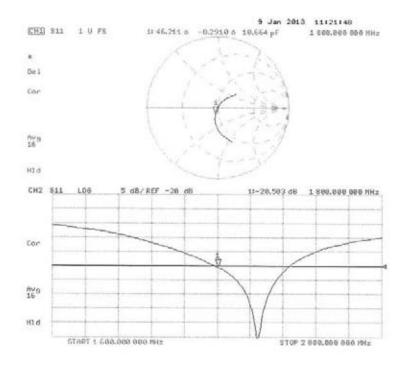
0 dB = 11.8 W/kg = 10.72 dBW/kg

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Impedance Measurement Plot for Head TSL



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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	
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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		
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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

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🚟 BlackBerr	y	Appendix D for the RFV121LW SAR R	Page 44(61)		
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 ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.2 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	5.26 W/kg

Certificate No: D1900V2-545_Jan13

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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

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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

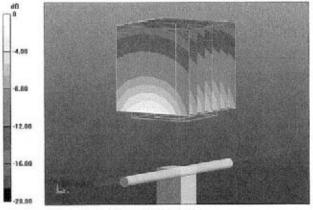
Communication System: CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.38$ S/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



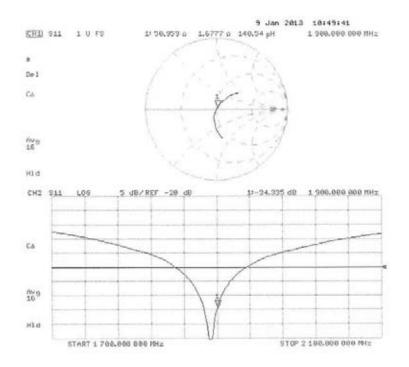
0 dB = 12.2 W/kg = 10.86 dBW/kg

Certificate No: D1900V2-545_Jan13

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SlackBer	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 47(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: D1900V2-545_Jan13

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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	
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	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.	
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SlackBerry		Document Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report					Page 49(61)
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						
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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

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SlackBerr	y	Appendix D for the RFV121LW SAR R	BlackBerry® Smartpho Report	one Model	Page 50(61)
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 ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	54.1 mW /g ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	6.39 mW / g

Certificate No: D2450V2-747_Nov11

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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

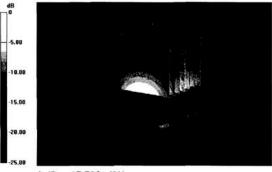
Communication System: CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz; $\sigma = 1.84$ mho/m; $\varepsilon_r = 37.7$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



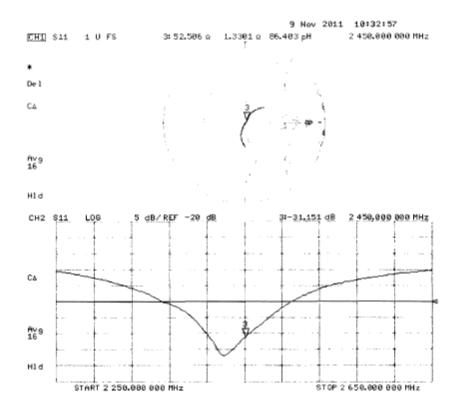
 $0 \, dB = 17.780 \, mW/g$

Certificate No: D2450V2-747_Nov11

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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



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					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	
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	Object	D5GHzV2 - SN	5 1033 °	S To William Market States	
	Calibration procedure(Calibration proc	cedure for dipole validation kits t	between 3-6 GHz	
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	Calibration date:		2011		
	This calibration certific	November 15, a		l units of measurements (SI).	
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	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.	
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	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	
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	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	
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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	
	Glossary: 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	
	 Measure 		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.
	 SAR mea 	asured: SAR measured	d at the stated antenna inp	out power.	
	 SAR non connecto 		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 ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.16 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	80.8 mW /g ± 17.0 % (k=2)

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

Head TSL parameters at 5500 MHz

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

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

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

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Appendix

Antenna Parameters with Head TSL at 5200 MHz

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

Antenna Parameters with Head TSL at 5500 MHz

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

Antenna Parameters with Head TSL at 5800 MHz

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

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 ns

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

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 09, 2004

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DASY5 Validation Report for Head TSL

Date: 15.11.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

DASY52 Configuration:

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

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

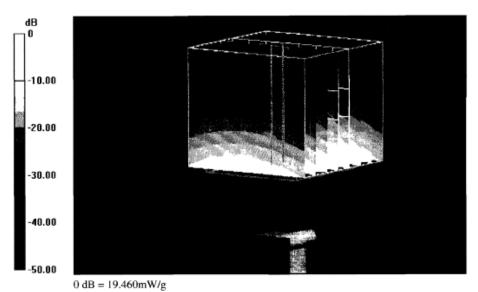
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 66.819 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 35.056 W/kg SAR(1 g) = 8.82 mW/g; SAR(10 g) = 2.5 mW/g Maximum value of SAR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

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

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

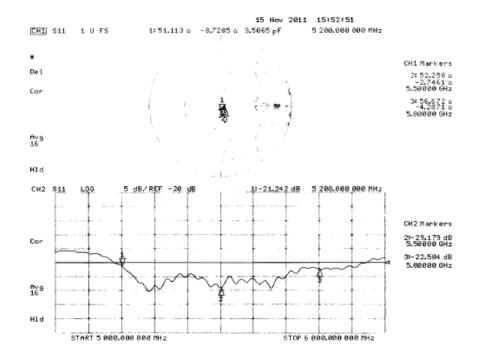


Certificate No: D5GHzV2-1033_Nov11

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SlackBerry		Appendix D for the BlackBerry® Smartphone Model RFV121LW SAR Report			Page 61(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



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