*** BlackBerry	/	Appendix C for the (STV100-1) SAR R	BlackBerry® Smartpho eport	ne Model RHK211L	W	Page 1(91)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 1	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-R	RHK210LW

APPENDIX C: PROBE & DIPOLE CALIBRATION DATA

*** BlackBerry

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **2(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Probe 1643

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





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

Accreditation No.: SCS 0108

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

Blackberry Waterloo

Certificate No: ET3-1643 Mar15

CALIBRATION CERTIFICATE

Diplet ET3DV6 - SN:1643

Calibration procedure(s) QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: March 13, 2015

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI)
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

Frimary Standards	(D)	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498097	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: 85054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-14 (No. ES3-3013_Dec14)	Dec-15
DAE4	SN: 660	14-Jan-15 (No. DAE4-860 Jan15)	Jan-16
Secondary Standards	10	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

Name Function Signature

Calibrated by: Iarae Elnaining Laboratory Technician

Approved by: Katja Pokovic Technical Manager

Issued: March 13, 2015

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

Certificate No: ET3-1643_Mar15

Page 1 of 11

*** BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

3(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID:

L6ARHK210LW

2503A-RHK210LW

Calbration Laboratory of Schnid & Partner Eligineering AG Zeu 9 ausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Approvided by the Swiss Accreditation Service (SAS)

The Sviss Accreditation Service is one of the signatures to the EA. Muffilteral Agreement for the recognition of calibration certificates

Glossary:

NORUX, y.z CONVE DCP

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

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters A, B.C.D

Potatization m o rotation around probe axis

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

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

information used in DASY system to align probe sensor X to the robot coordinate system Conhector Angle

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement
- Techniques', June 2013 IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 8 = 0 (f < 900 MHz in TEM-cell; f > 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E'-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Charl). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- 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 phanton: using E-field (or Temperature Transfer Standard for f s 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,v.z.* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100
- Spherical isotropy (3D deviation from isotropy): in a field of 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.
- Connector Angle: The angle is assessed using the Information gained by determining the NORMx (no uncertainty required),

Certificate No; ET3-1643_Mar16

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Page **4(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: 1. L6ARHK210LW 2.

2503A-RHK210LW

Probe ET3DV6

SN:1643

Manufactured: Calibrated:

November 7, 2001 March 13, 2015

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

(Note: non-compatible with DAS12 system)

Certificate No: ET3-1643_Mar15

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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

ETૐD/6-SN:1643

March 13, 2015

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1643

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
NQ ^m (μV/(V/m) ²) ^A	1.76	1.95	1.75	± 10.1 %
DCP (mV)B	101.5	100.5	102.4	

Modulation Calibration Parameters

UIP	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	261.1	±3.8 %
		Y	0.0	0.0	1.0		237.4	
		Z	0.0	0.0	1.0		267.0	

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: ET3-1643_Mar15

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

Numerical linearization parameter; uncertainty not required.

Numerical linearization parameter; uncertainty not required.

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



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Author Data **Andrew Becker** Dates of Test **July 15 – Sept 21, 2015** Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

ET/30V6- SN:1643

March 13, 2015

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1643

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	6.69	6.69	6.69	0.32	3.00	± 12.0 %
900	41.5	0.97	6.09	6.09	6.09	0.33	3.00	± 12.0 %
1810	40.0	1.40	5.18	5.18	5.18	0.80	2.02	± 12.0 %
1950	40.0	1.40	4.93	4.93	4.93	0.80	2.06	± 12.0 %
2450	39.2	1.80	4.58	4.58	4.58	0.80	1.62	± 12.0 %

^C Frequency validity above 300 MHz 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. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity or an be extended to ± 110 MHz.

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

*Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Certificate No: ET3-1643_Mar15



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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

ET 20V6- SN:1643

March 13, 2015

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1643

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	55.5	0.96	6.29	6.29	6.29	0.36	2.49	± 12.0 %
900	55.0	1.05	6.00	6.00	6.00	0.33	3.00	± 12.0 %
1810	53.3	1.52	4.50	4.50	4.50	0.80	2.60	± 12.0 %
1950	53.3	1.52	4.56	4.56	4.56	0.80	2.23	± 12.0 %
2450	52.7	1.95	3.93	3.93	3.93	0.70	1.60	± 12.0 %

⁶ Frequency validity above 300 MHz 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. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency

Certificate No: ET3-1643_Mar15

Page 6 of 11

salidity can be extended to ± 110 MHz.

At frequencies below 3 GHz, the validity of tissue parameters (s and o) can be relaxed to ± 10% if liquid compensation formula is applied to

At requencies below 3 GHz, the valuity or issue parameters (s and o) can be relaxed to ± 10% if injude compensation formula is applied to the account of the ConvF uncertainty for indicated target tissue parameters.

Apha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

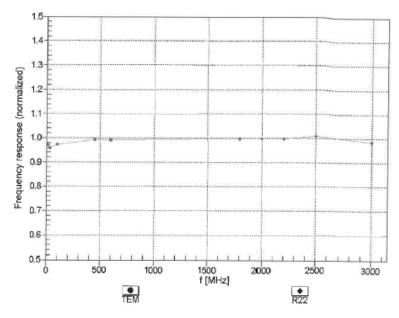
2503A-RHK210LW

ET 30V6- SN:1643

March 13, 2015

Frequency Response of E-Field

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



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



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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID:

L6ARHK210LW

2503A-RHK210LW

ET 30V6- SN:1643

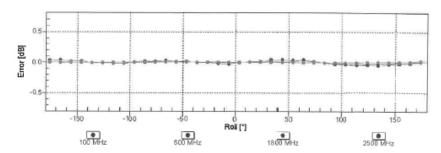
Tot

March 13, 2015

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

f=600 MHz,TEM





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

Certificate No: ET3-1643_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

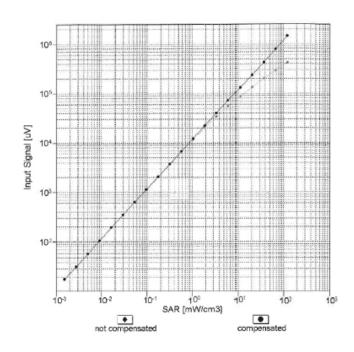
FCC ID: L6ARHK210LW

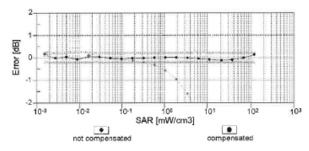
2503A-RHK210LW

ET/30/v6~ SN:1643

March 13, 2015

Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)





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

Certificate No: ET3-1643_Mar15

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

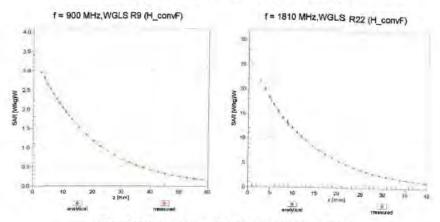
FCC ID: L6ARHK210LW

2503A-RHK210LW

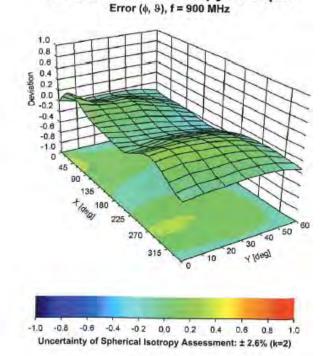


March 13, 2015

Conversion Factor Assessment



Deviation from Isotropy in Liquid



Certificate No: ET3-1643_Mar15

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Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

ET 30V6- SN:1643

March 13, 2015

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1643

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	3.8
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	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

Certificate No: ET3-1643_Mar15

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*** BlackBerry	/	Appendix C for the B (STV100-1) SAR Rep	lackBerry® Smartphor ort	ne Model RHK211LV	W	Page 13(91)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 1	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-R	RHK210LW

Probe 3225

*** BlackBerry

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **14(91)**

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

L6ARHK210LW

FCC ID:

2503A-RHK210LW

Ca libration Laboratory of Sc firid & Partner En§ineering AG Zeu €hasstrasse 43,8004 Zurich, Switzerland





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

S Swiss Calibration Service
Accreditation No.: SCS 0108

Accoredity by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Mul# list al Agreement for the recognition of calibration certificates

Clie M

Blackberry Waterloo

Certificate No: ES3-3225_Feb15

CALIBRATION CERTIFICATE

Object

ES3DV3 - SN:3225

Callibration procedure(s)

QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes

Cali bration date:

February 25, 2015

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

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Powersensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN; S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN; S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-14 (No. ES3-3013_Dec14)	Dec-15
DAE4	SN: 660	14-Jan-15 (No. DAE4-660_Jan15)	Jan-16
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8848C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

Calibrated by:

Name
Function
Laboratory Technician

Approved by:

Katja Pokovic

Technical Manager

Issued: February 25, 2015

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

Certificate No: ES3-3225 Feb15

Page 1 of 11

*** BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

15(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Ca ^{lit}ration Laboratory of Schhid & Partner Figineering AG Zeu Shusstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Acc F^{eq}ted by the Swiss Accreditation Service (SAS)

The Shiss Accreditation Service is one of the signatories to the EA Mulf tiliteral Agreement for the recognition of calibration certificates

GIP%sary:

NO RIIX, y, z CorTVR

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

DCP CF Ã, B, C, D

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization o

φ rotation around probe axis

Polarization 8

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

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

Cornector Angle

information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- 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
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: ES3-3225 Feb15

Page 2 of 11



Page **16(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Probe ES3DV3

SN:3225

Manufactured: Repaired: September 1, 2009 February 18, 2015

Calibrated:

February 25, 2015

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ES3-3225_Feb15

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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

ES:30/3-SN:3225

February 25, 2015

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

B# Sc Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
NΦ ^(h) (μV/(V/m) ²) ^A	1.07	1.00	1.12	± 10.1 %
DCF (mV)B	107.0	106.0	105.6	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc [±] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	196.9	±3.3 %
		Y	0.0	0.0	1.0		189.2	
		Z	0.0	0.0	1.0		195.9	

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

Certificate No: ES3-3225_Feb15

Page 4 of 11

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

⁵ Numerical linearization parameter; uncertainty not required.

⁶ Uncortainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

ES \$10/3- SN:3225

February 25, 2015

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

Ca libration Parameter Determined in Head Tissue Simulating Media

f(MHz) ^C	Relative Permittivity ^F	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ⁶	Depth ⁶ (mm)	Unct. (k=2)
750	41.9	0.89	6.50	6.50	6.50	0.61	1.31	± 12.0 %
900	41.5	0.97	6.22	6.22	6,22	0.30	1.84	± 12.0 %
1810	40.0	1.40	5.26	5.26	5.26	0.50	1.46	± 12.0 %
1950	40.0	1.40	5.01	5.01	5.01	0.80	1.11	± 12.0 %
2300	39.5	1.67	4.77	4.77	4.77	0.75	1.25	± 12.0 %
2450	39.2	1.80	4.60	4.60	4.60	0.57	1.49	± 12.0 %
2600	39.0	1.96	4.40	4.40	4.40	0.72	1.30	± 12.0 %

⁶ Frequency validity above 300 MHz 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. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

F. At frequencies below 3 GHz, the validity of tissue parameters (c and d) can be relaxed to ± 10% if liquid compensation formula is applied to

Certificate No: ES3-3225_Feb15

Page 5 of 11

At requences elected 3 GHz, the valency or issue parameters (c and or) can be resized to 2 Hz/s in rique compensation formula is applied to the assert AR values. At frequencies above 3 GHz, the validity of tissue parameters (s and or) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ApplieDepth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip digmeter from the boundary.



19(91)

Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

ES 5 D 3 SN:3225

February 25, 2015

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

Ca Iltration Parameter Determined in Body Tissue Simulating Media

f MHz) C	Relative Permittivity ^f	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ⁶	Depth ^G (mm)	Unct. (k=2)
750	55.5	0.96	6.19	6.19	6.19	0.80	1.23	± 12.0 %
900	55.0	1.05	6.07	6.07	6.07	0.53	1.41	± 12.0 %
1810	53.3	1.52	4.89	4.89	4.89	0.63	1.46	± 12.0 %
1950	53.3	1.52	4.86	4.86	4.86	0.44	1.86	± 12.0 %
2300	52.9	1.81	4.48	4.48	4.48	0.80	1.29	± 12.0 %
2450	52.7	1.95	4.34	4.34	4.34	0.72	1.14	± 12.0 %
2600	52.5	2.16	4.06	4.06	4.06	0.80	1.08	± 12.0 %

⁶ Frequency validity above 300 MHz 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 CorvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 310 MHz is ± 10, 25, 40, 50 and 70 MHz for CorvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency

Certificate No: ES3-3225_Feb15

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below 310 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

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

AphraDepth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip digm-eter from the boundary.



20(91)

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID:

L6ARHK210LW

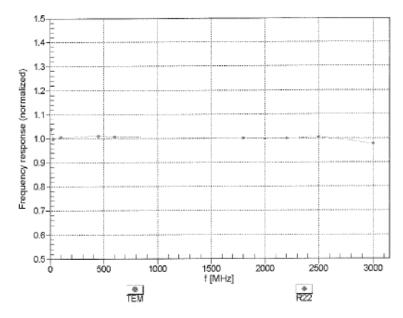
2503A-RHK210LW

ESS^D3- SN:3225

February 25, 2015

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_Feb15

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

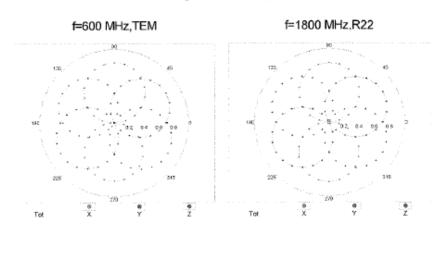
FCC ID: I. L6ARHK210LW 2

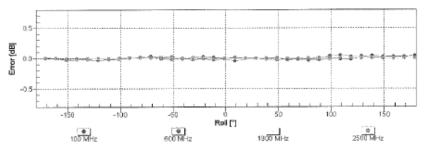
2503A-RHK210LW

ES# D/3- SN:3225

February 25, 2015

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





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

Certificate No: ES3-3225_Feb15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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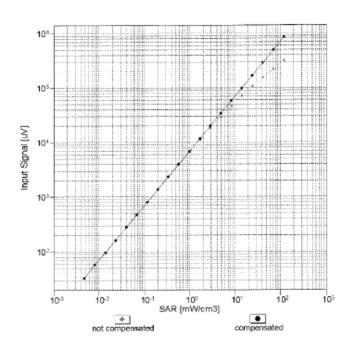
Author Data **Andrew Becker**

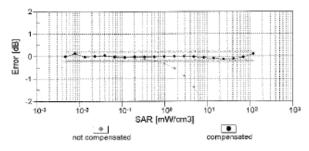
Dates of Test **July 15 – Sept 21, 2015**

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

(TEM cell , feval= 1900 MHz)





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

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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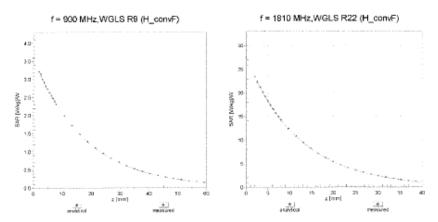
Author Data **Andrew Becker** Dates of Test July 15 – Sept 21, 2015 Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

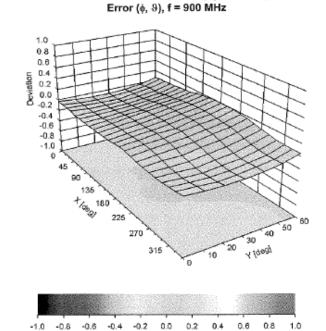
ES 20/3-SN:3225

February 25, 2015

Conversion Factor Assessment



Deviation from Isotropy in Liquid



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

Certificate No: ES3-3225_Feb15

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

ES学^{D/}3- SN:3225

February 25, 2015

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

Ot Probe Parameters

S@ ^{∩t} or Arrangement	Triangular
COnjector Angle (°)	-61.4
Medianical Surface Detection Mode	enabled
Op ^{1k} al Surface Detection Mode	disabled
Prote Overall Length	337 mm
Prote Body Diameter	10 mm
Tip length	10 mm
Tip Diameter	4 mm
Prote Tip to Sensor X Calibration Point	2 mm
Prote Tip to Sensor Y Calibration Point	2 mm
Prote Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Certificate No: ES3-3225_Feb15

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≅ BlackBerry		Appendix C for the B (STV100-1) SAR Rep	V	Page 25(91)		
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 1	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-R	HK210LW

Probe 3592

∷ BlackBerry

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

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





S Schweizenischer Kallbrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation Service is one of the signatories to the EA

Client

Blackberry Waterloo

Certificate No: EX3-3592_Nov14

CALIBRATION CERTIFICATE

Multilateral Agreement for the recognition of calibration certificates

Object

EX3DV4 - SN:3592

Calibration procedure(s)

QA CAL-01,v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6

Calibration procedure for dosimetric E-field probes

Calibration date:

November 10, 2014

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

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID:	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3u)	. 03 Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	(3-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN; S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ESUDV2	5N: 3013	30-Dec-13 (No. ES3-3013, Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-960_Dec13)	Dec-14
Secondary Standards	(0)	Gheck Date (in house)	Schadulad Check
RI- generator HP 8648C	U83642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753F	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Ost-16

Name Function Signature
Calibrated by: Leif Klyanes Labaratory Technician

Approved by: Ketja Pukovic Technical Manager

Issued: November 10, 2014

This celluration certificate shall not be reproduced except in full without written approval of the liaboratory.

Certificate No: EX3-3592_Nov14

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≅ BlackBerry

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Calibration Laboratory of

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





S Schweizerlscher Kalibrierdiensi
C Service suisse d'étalonnage
Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

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

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

Polarization q o rotation around probe axis

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

i.e., 8 = 0 is normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- i) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1. "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)". February 2005

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
 NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; 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 clode.
- ConvF and Boundary Effect Perameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for 1 < 800 MHz) and inside waveguide using analytical field distributions based on power measurements for 1 > 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 * CornvF 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.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **28(91)**

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

EX3DV4 - SN:3592

November 10, 2014

Probe EX3DV4

SN:3592

Manufactured: Calibrated: September 18, 2006 November 10, 2014

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

Certificate No: EX3-3592 Nov14

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Author Data **Andrew Becker** Dates of Test **July 15 – Sept 21, 2015** Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

EX3DV4-SN:3592

November 10, 2014

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)	
Nomi (µV/(V/m)²) ^A	0.48	0.47	0.40	±10.1 %	
DCP (mV) ⁴	95,2	98.0	98.8		

Modulation Calibration Parameters

מוט	Communication System Name		A dB	B dB√μV	С	dB	VR mV	Unc ^E (k=2)
0	CW	×	0.0	0.0	1.0	0.00	145.9	±3.3 %
	10-51	Y	0.0	0,0	1.0		156.9	
		Z	0.0	0.0	1.0		149.1	

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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 $^{^{\}Lambda}$ The uncertainties of NormX, Y.Z do not affect the E 2 field uncertainty inside TSL (see Pages 5 and 6).

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



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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

EX3DV4-SN:3592

November 10, 2014

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

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
2600	39.0	1.96	6.80	6.80	6.80	0.36	0.93	±12.0 %
5250	35.9	4.71	4.63	4.63	4.63	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.20	4.20	4.20	0.40	1.80	± 13.1 %
5750	35.4	5.22	4.34	4.34	4.34	0.40	1.80	± 13.1 %

Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v1.4 and higher (see Page 2), also it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 45, 50 and 70 MHz for ConvE assessments at 30, 84, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

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validity can be extended to ± 110 MHz.

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

AlphaPerbh are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies ballow 3 GHz and below ± 2% for frequencies between 3-8 GHz at any distance larger than half the probe to

diameter from the boundary.



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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

EX3DV4 SN:3592

November 10, 2014

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

Calibration Parameter Determined in Body Tissue Simulating Media

F(MHz) C	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^C (mm)	Unct. (k=2)
2600	52.5	2.18	6.84	6.84	6,84	0.78	0.62	± 12.0 %
5250	48,9	5.36	4.06	4.06	4.06	0.45	1.90	± 13.1 %
5600	48.5	5.77	3.78	3.78	3.78	0.45	1.90	± 13.1 %
5750	48.3	5.94	3.81	3.81	3.81	0.50	1.90	± 13.1 %

Frequency validity above 300 MHz of ± 103 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. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

At frequencies below 3 GHz, the validity of tissue parameters (cland of can be released to ± 10% if liquid compansation formula is applied to

Certificate No: EX3-3592_Nov14

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At requencies below 3 GHz, the validity or issue parameters (a and a) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated largel tissue parameters.

Apha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always loss than ± 1% for frequencies below 3 GHz and helow ± 2% for frequencies between 3.6 GHz at any distance larger than half the probe tip claimator from the boundary.



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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: IC L6ARHK210LW 2

2503A-RHK210LW

EX3DV4- 5N:3592

November 10, 2014

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

1.5 Frequency response (normalized) 1.1 1.0 0.9 0.8 0.7 0.6 0.5 2500 1000 2000 3000 Ó 500 1500 f [MHz] TEM R22

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

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EX3DV4-SN:3592

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

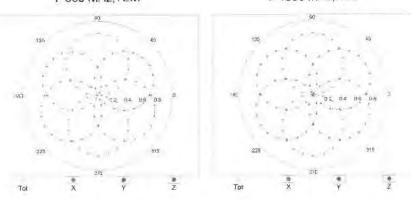
Test Report No **RTS-6066-1509-15**

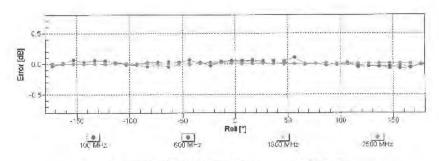
FCC ID: 1 L6ARHK210LW 2

November 10, 2014

2503A-RHK210LW







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

Certificate No: EX3-3592_Nov14

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: 1. L6ARHK210LW 2.

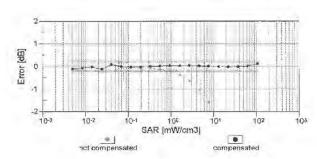
2503A-RHK210LW

EX3DV4 SN:3592

November 10, 2014

Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)

10⁵ 10² 10³ 10³ 10³ 10³ 10³ SAR [mW/cm3]



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

Certificate No: EX3-3592 Nov14

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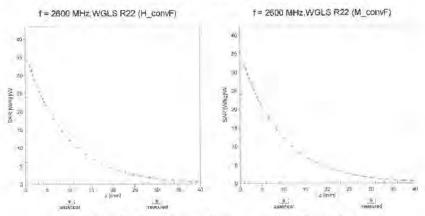
Author Data **Andrew Becker** Dates of Test July 15 – Sept 21, 2015 Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

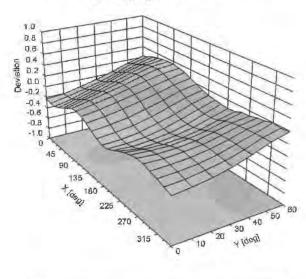
EX3DV4-SN:3592

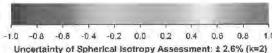
November 10, 2014

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (φ, θ), f = 900 MHz





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Appendix C for the BlackBerry \otimes Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

EX3DV4-SN:3592

November 10, 2014

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

Other Probe Parameters

Sensor Arrangement	Triangular		
Connector Angle (*)	-13.3		
Mechanical Surface Detection Mode	enabled		
Optical Surface Detection Mode	disabled		
Probe Overall Length	337 mm		
Probe Body Diameter	10 mm		
Tip Length	9 mn		
Tip Diameter	2.5 mm		
Probe Tip to Sensor X Calibration Point	mm f		
Probe Tip to Sensor Y Calibration Point	1 mm		
Probe Tip to Sensor Z Calibration Point	1 mm		
Recommended Measurement Distance from Surface	1,4 mm		

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≅ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

W 250

2503A-RHK210LW

750 Dipole

Caliphation Laboratory of Schrift & Partner Engheering AG Zeughe Strasse 43, 8004 Zurich, Switzerland





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Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

Accred Its by the Swiss Accreditation Service (SAS)

The Sw^Nis Accreditation Service is one of the signatories to the EA Multile teal Agreement for the recognition of calibration certificates

Client Blackberry Waterloo

Certificate No: D750V3-1021 Mar15

CALIBRATION CERTIFICATE D750V3 - SN:1021 Object QA CAL-05.v9 Calibration procedure(s) Calibration procedure for dipole validation kits above 700 MHz March 11, 2015 Calibration date: This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (St). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate, All calibrations have been conducted in the closed faboratory facility; environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards ID # Cal Date (Certificate No.) Scheduled Calibration GB37480704 Power mater EPM-442A 07-Oct-14 (No. 217-02020) Oct-15 US37292783 Power sensor HP 8481A 07-Oct-14 (No. 217-02020) Oct-15 Power sensor HP 8481A MY41092317 07-Oct-14 (No. 217-02021) Oct-15 Reference 20 dB Attenuator SN: 5058 (20k) 03-Apr-14 (No. 217-01918) Apr-15 Type-N mismatch combination SN: 5047.2 / 06327 03-Apr-14 (No. 217-01921) Apr-15 Reference Probe ES3DV3 SN: 3205 30-Dec-14 (No. ES3-3205, Dec14) Dec-15 DAE4 SN: 601 18-Aug-14 (No. DAE4-601_Aug14) Aug-15 Secondary Standards Check Date (in Nouse) Scheduled Check RF generator R&S SMT-06 100005 04-Aug-99 (in house check Oct-13) In house check: Oct-1ff Network Analyzer HP 8753E US37390585 S4206 In house check: Oct-15 18-Oct-01 (in house check Oct-14) Name Function Calibrated by: Michael Weber Laboratory Technician Approved by: Katja Pokovic Technical Manager Issued: March 11, 2015 This calls ration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificat-e No: D750V3-1021_Mar15

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Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

38(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Calibation Laboratory of

Schmill & Partner Engheering AG Zeughar Visitrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accordite by the Swiss Accorditation Service (SAS)

The Swift Accreditation Service is one of the signatories to the EA

Multile *** of Agreement for the recognition of calibration certificates

Glossary:

ConvF

N/A

tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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	rement
multiplied by the coverage factor k=2, which for a normal distribution corresponds to a co	verage
proba bility of approximately 95%.	

Certificate No. D750V3-1021_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

39(91)

Author Data **Andrew Becker**

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 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	40.8 ± 6 %	0.90 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	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.28 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.42 W/kg ± 16.5 % (k=2)

Certificate No: D750V3-1021_Mar15



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page 40(91)

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

App@ndix (Additional assessments outside the scope of SCS 0108)

Ante Ina Parameters with Head TSL

Inpedance, transformed to feed point	$55.3 \Omega + 0.3 j\Omega$	
Fleturn Loss	- 25.9 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 ns

After IOng 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	December 01, 2010

Certificate No: D750V3-1021_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

DAS YS Validation Report for Head TSL

Date: 11.03.2015

Test Liboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: f = 750 MHz; $\sigma = 0.9 \text{ S/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Meas trement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

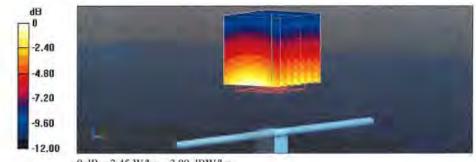
DAS Y52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.44, 6.44, 6.44); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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 = 54.15 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 3.15 W/kg

SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kgMaximum value of SAR (measured) = 2.45 W/kg



0 dB = 2.45 W/kg = 3.89 dBW/kg

Certificate No: D750V3-1021_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

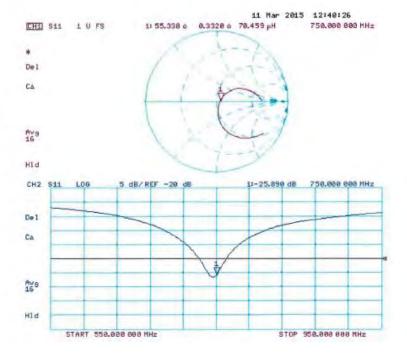
(STV100-1) SAR Report

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Author Data **Andrew Becker** Dates of Test July 15 – Sept 21, 2015 Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Imperiance Measurement Plot for Head TSL



Certificate No: D750V3-1021_Mar15

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*** BlackBerry	/	Appendix C for the B (STV100-1) SAR Rep	slackBerry® Smartphor oort	ne Model RHK211LV		Page 43(91)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 1	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-RH	HK210LW

835 Dipole

≅ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

44(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

CaliPlation Laboratory of Schrnd & Partner En Sneering AG Zough Alstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

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

Blackberry Waterloo

Certificate No: D835V2-446_Mar15

Object	D835V2 - SN:446		
Calibrælon procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	March 11, 2015		
		onal standards, which realize the physical un robability are given on the following pages an	
All calibrations have been condu	cted in the closed laborato	ry facility: environment temperaturé (22 ± 3)*(C and humidity < 70%.
		ry (scalely: environment temperaturé (22 ± 3)*(2 and humidity < 70%.
Calibration Equipment used [Ma		ry lacility, environment temperature (22 ± 3)*(Cal Date (Certificate No.)	C and humidity < 70%. Scheduled Calibration
Calibration Equipment used (M&	TE critical for calibration)		
Calibration Equipment used (Ma Primary Standards Power meter EPM-442A	TE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration
Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 84B1A	TE critical for calibration) ID # GB37480704	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020)	Scheduled Calibration Oct-15
Calibration Equipment used [M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A	TE critical for calibration) ID # GB37490704 US37292783	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020)	Scheduled Calibration Oct-15 Oct-15
Calibration Equipment used [M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15
Calibration Equipment used [M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205	Cal Date (Cerificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15
Calibration Equipment used [M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15
Calibration Equipment used [M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205	Cal Date (Cerificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15
Calibration Equipment used (M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	TE entical for calibration) ID.# GB37480704 US37292783 MV41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205 SN: 601	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01918) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15
Calibration Equipment used (M8 Primary Standards Prower meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ESSIDV3 DAE4 Secondary Standards RF generator R&S SMT-06	TE entical for calibration) ID.# GB37480704 US37292783 MV41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205 SN: 601	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01918) 18-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (inhouse)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check
Calibration Equipment used (M8 Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ESGDV3 DAE4 Secondary Standards RF generator R&S SMT-06	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205 SN: 601 ID.# 100005 US37390585 S4206	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (Inhouse) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16 In house check: Oct-16
Calibration Equipment used [Ma Primary Standards. Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RE generator R&S SMT-06 Network Analyzer HP 8753E	TE entical for calibration) ID.# GB37480704 US37292783 M*41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205 SN: 601 ID.# 100005 US37390585 S4208 Name	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 03-Apr-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (Inhouse) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16 In house check: Oct-16
Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	TE entical for calibration) ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047 2 / 06327 SN: 3205 SN: 601 ID.# 100005 US37390585 S4206	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (Inhouse) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-14)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16

Certificate No: D835V2-446_Mar15

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Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Califration Laboratory of

SchrTld & Partner Ert9ineering AG Zeughr²isstrasse 43, 8004 Zurich, Switzerland





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Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizie avizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

Accreditation Service (SAS)

The S^Mas Accreditation Service is one of the signatories to the EA Multil[®]Brai Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

ConvF N/A

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- EC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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 Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data **Andrew Becker**

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Mea Surement Conditions

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

DASY Version	DASY5	V52.8.8
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	40.6 ± 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	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.28 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.06 W/kg ± 16.5 % (k=2)

Certificate No: D835V2-446_Mar15



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page 47(91)

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID:

L6ARHK210LW

2503A-RHK210LW

App€\dix (Additional assessments outside the scope of SCS 0108)

Ante na Parameters with Head TSL

Inpedance, transformed to feed point	50.6 Ω - 4.8 jΩ
Return Loss	- 26.4 dB

Gen€ral Antenna Parameters and Design

\sim	
Electrical Delay (one direction)	1.383 ns

After IOng 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 "Measu*erment 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_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page 48(91)

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

DAS \$5 Validation Report for Head TSL

Date: 11.03.2015

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; $\sigma = 0.92$ S/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

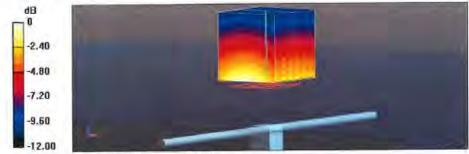
Meas rement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DAS \$52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.2, 6.2, 6.2); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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 = 56.83 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 3.55 W/kg SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.54 W/kg Maximum value of SAR (measured) = 2.78 W/kg



0 dB = 2.78 W/kg = 4.44 dBW/kg

Certificate No: D835V2-446_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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Author Data **Andrew Becker**

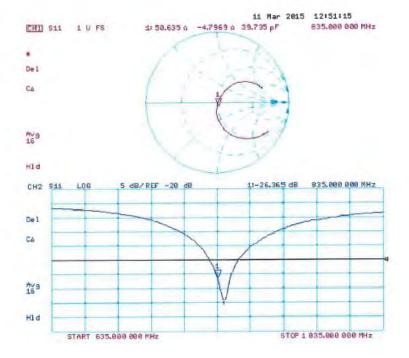
Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Mar15

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≅ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

50(91)

Author Data **Andrew Becker**

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

1800 Dipole

Cal bration Laboratory of Sch mil & Partner Engineering AG Zeughaustrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

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

Client Blackberry Waterloo

	CERTIFICAT	E	
Object	D1800V2 - SN:	2d020	
Calibration procedure(s)	QA CAL-05.v9 Calibration proc	edure for dipole validation kits ab	ove 700 MHz
Calibration date:	March 12, 2015		
The measurements and the unce	ertainties with confidence p	ional standards, which realize the physical ur probability are given on the following pages ar ry facility: environment temperature (22 ± 3)°	nd are part of the certificate,
Calibration Equipment used (M&	TE critical for calibration)		
Primary Standards	ID#	Cal Date (Certificate No.)	Scheduled Calibration
	GB37480704	07-Oct-14 (No. 217-02020)	
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01918) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14)	Oct-15 Oct-15 Apr-15 Apr-15 Dec-15
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. E53-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-14)	Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ESS-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (in house) 04-Aug-99 (in house check Oct-13)	Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16 In house check: Oct-15
Power meler EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by:	MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. E53-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-14)	Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16 In house check: Oct-15

Certificate No: D1800V2-2d020_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

51(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Cali bration Laboratory of

Schmid & Partner Engineering AG Zeug Pausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

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

Glossary:

TSL Con VF

N/A

tissue simulating liquid

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

Cali bration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D1800V2-2d020_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Fage **52(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Me@strement Conditions

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

Dasy Version	DASY5	V52.8.8
Etrapolation	Advanced Extrapolation	1.000
Plantom	Modular Flat Phantom	
Detance Dipole Center - TSL	10 mm	with Spacer
Zom Scan Resolution	dx, dy , $dz = 5 mm$	and a parent
Frequency	1800 MHz ± 1 MHz	

Head 7SL 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	39.1 ± 6 %	1.41 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	1 g) of Head TSL Condition	
SAR measured	250 mW input power	9.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	38.5 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.08 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.2 W/kg ± 16.5 % (k=2)



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Fage **53(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

45.8 Ω - 8.4 jΩ	
- 20.2 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1915
	1.215 ns

After fong 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 and ded to the dipole arms in order to improve matching when loaded according to the position as explained in the 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_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

Date: 12.03.2015

2503A-RHK210LW

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 1800 MHz

Medium parameters used: f = 1800 MHz; $\sigma = 1.41$ S/m; $\varepsilon_r = 39.1$; $\rho = 1000$ kg/m³

Phan tom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DAS Y52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.06, 5.06, 5.06); Calibrated; 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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 = 94.84 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 17.9 W/kg SAR(1 g) = 9.71 W/kg; SAR(10 g) = 5.08 W/kg Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 12.0 W/kg = 10.79 dBW/kg



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **55(91)**

Author Data
Andrew Becker

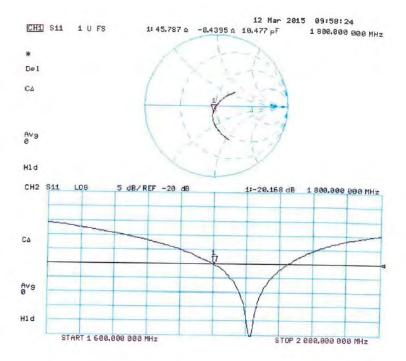
Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: I L6ARHK210LW 2

2503A-RHK210LW

Impedance Measurement Plot for Head TSL



Certificate No: D1800V2-2d020_Mar15

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1900 Dipole

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Calf bration Laboratory of Schmid & Partner

Engineering AG
Zeugrausstrasse 43, 8004 Zurich, Switzerland





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

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multifaleral Agreement for the recognition of calibration certificates

Blackberry Waterloo

Accreditation No.: SCS 0108

Certificate No: D1900V2-545_Mar15

CALIBRATION CERTIFICATE

Object

D1900V2 - SN:545

Calin ration procedure(s)

QA CAL-05.v9

Calibration procedure for dipole validation kits above 700 MHz

Calibration date:

March 12, 2015

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibration Equipment used (M&TE critical for calibration)

	ID a	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-16
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	in house check: Det-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house chirck Oct-14)	In house check: Oct-15
	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	Signature
			161

Certificate No: D1900V2-545_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Cal # bration Laboratory of

Sch mid & Partner Emgineering AG Zeug Frausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accres cited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL Con VF tissue simulating liquid

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

Cali bration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

58(91)

Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Me@surement Conditions

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

ASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
hantom	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.

and the second second second second	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	39.0 ± 6 %	1.38 mho/m ± 5 %
Head TSL temperature change during test	< 0.5 °C	122	-

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9,88 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.6 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.8 W/kg ± 16.5 % (k=2)

Certificate No: D1900V2-545_Mar15



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Fage **59(91)**

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

50.9 \Omega + 0.9 \Omega
- 37.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1,199 ns

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

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

Certificale No: D1900V2-545_Mar15

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≅ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

60(91)

Author Data **Andrew Becker** Dates of Test July 15 – Sept 21, 2015 Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

Date: 12.03,2015

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

Con munication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; $\sigma = 1.38 \text{ S/m}$; $\epsilon_r = 39$; $\rho = 1000 \text{ kg/m}^3$

Pharatom section: Flat Section

Mea-surement Standard: DASY5 (IEEE/IEC/ANSI C63:19-2011)

DAS Y52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5, 5, 5); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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 = 96.17 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 18.1 W/kg SAR(1 g) = 9.88 W/kg; SAR(10 g) = 5.18 W/kgMaximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **61(91)**

Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

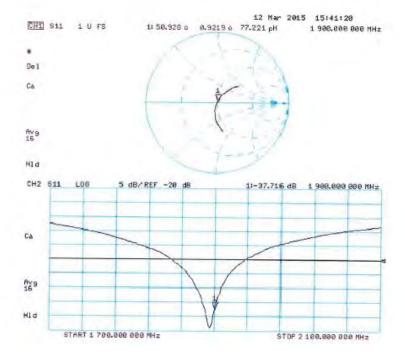
Test Report No **RTS-6066-1509-15**

FCC ID:

L6ARHK210LW

2503A-RHK210LW

Impredance Measurement Plot for Head TSL



Certificate No: D1900V2-545 Mar15

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### BlackBerry	/	Appendix C for the B (STV100-1) SAR Rep	lackBerry® Smartphor ort	ne Model RHK211LV	V	Page 62(91)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 1	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-R	HK210LW

2450 Dipole

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

63(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

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





S Schwelzerischer Kalibrierdlenst
C Service suisse d'étalonnago
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the sign:

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

client Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D2450V2-791_Sep13

Object	D2450V2 - SN: 7	91	
Calibration procedure(s)	QA CAL-05.v9		
	Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date;	September 10, 20	013	
This calibration optificate docum	ents the traceability to nati	onal stendards, which realize the physical un	its of measurements (SI).
		robability are given on the following pages an	
All calibrations have been condu	cted in the closed laborator	y facility: environment temperature (22 ± 3)*0	S and humidity $< 70\%$.
Calibration Equipment used (M&	FE critical for calibration)		
	FE critical for calibration)	Cal Date (Certificate No.)	Schoduled Calibration
Primary Standards		Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640)	Schoduled Calibration Oct-13
Primary Standards Power mater EPM-442A	ID ti	The state of the s	
Primary Standards Power meter CPM-442A Power sensor HP 8481A	ID # GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Primary Standards Power meter EPM-442A Power sonsor HP 8481A Reference 20 dB Attenuator	ID # GB37480704 US37292783	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640)	Oct-13 Oct-13
Primary Standards Power meter EPM-442A Power sonsor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ID # GB37480704 US37292783 SN: 5058 (20k)	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736)	Oct-13 Oct-13 Apr-14
Primary Standards Power mater CPM-442A Power sensor HP 8481 A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	ID # GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327	01-Nov-12 (No. 217-01840) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739)	Oct-13 Oct-13 Apr-14 Apr-14
Primary Standards Power mater EPM-442A Power sonsor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ID # GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ESS-3205_Dec12)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14 Scheduled Check
Primary Standards Power mater EPM-442A Power sonsor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14
Primary Standards Power mater EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A	ID# GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01799) 28-Dac-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13) Chock Date (in house)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14 Scheduled Check
Primary Standards Power mater EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID# GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 96327 SN: 3205 SN: 601 ID # MY41092317	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13) Chock Date (in house)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14 Scheduled Gheck In house check; Oct-13
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB87480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01736) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13) Chock Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14 Scheduled Check In house check: Oct-13 In house check: Oct-13 Skmature
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ID# GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3204 SN: 601 ID # MY41092317 100005 US37390585 \$4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01736) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13) Chock Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12)	Oct-13 Oct-13 Apr-14 Apr-14 Deu-13 Apr-14 Scheduled Check In house check: Oct-13 In house check: Oct-13 Skmature
Calibration Equipment used (M& Primary Standards Power maler EPM-442A Power sensor HP 8481 A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by Approved by:	ID# GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 \$4206	01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01736) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAF4-601_Apr13) Chock Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12)	Oct-13 Oct-13 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check; Oct-13 In house check; Oct-13 In house check; Oct-13

Certificate No: D2450V2-791_Sep13

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Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

64(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Calibration Laboratory of

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





Schweizerischer Kallbrierdienst
 Service suisse d'étatonnage
 Servizio svizzero di taratura
 Swiss Callbratton Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Glossary:

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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: D2450V2-791_Sep13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **65(91)**

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
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	39.4 ± 6 %	1.83 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	1-44	-

SAR result with Head TSL

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	51.6 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.0 W/kg ± 16.5 % (k=2)

Certificate No: D2450V2-791_Sep13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **66(91)**

Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56 1 Ω + 3.4 jΩ	
Return Loss	- 23,6 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 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	January 24, 2006	

Certificate No: D2450V2-791_Sep13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

DASY5 Validation Report for Head TSL

Date: 10.09,2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type; D2450V2; Serial: D2450V2 - SN: 791

Communication System: UID 0 - CW; Frequency: 2450 M1Iz

Medium parameters used: f = 2450 MHz; $\sigma = 1.83$ S/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

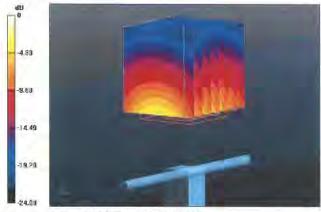
DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.52, 4.52, 4.52); Calibrated: 28.12,2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics; DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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 = 99.824 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 26.7 W/kg SAR(1 g) = 13 W/kg; SAR(10 g) = 6.03 W/kg

Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg

Certificate No: D2450V2-791 Sep13

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Appendix C for the BlackBerry \otimes Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

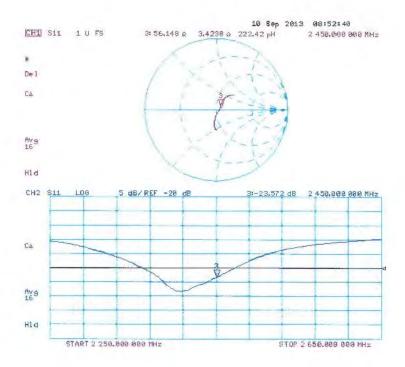
July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-791_Sep13

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Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Calibration Laboratory of

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





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

Accredited by the Swiss Accreditation Service (SAS)

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

Client Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D2450V2-747_Nov13

	CERTIFICATE		
Object	D2450V2 - SN: 7	747	
Calibration procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits a	bove 700 MHz
Calibration date:	November 14, 20	013	
The measurements and the unge	rtainties with confidence p	ional standards, which realize the physical robability are given on the following pages by facility: environment temperature (22 \pm 3	and are part of the certificate.
Calibration Equipment used (M&	TE critical for calibration)		
rimary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
ower meter EPM-442A	ID # GB37480704	Cal Date (Certificate No.) 09-Oct-13 (No. 217-01827)	Scheduled Calibration Oct-14
ower meter EPM-442A ower sensor HP 8481A	-		
ower meter EPM-442A lower sensor HP 8481A lower sensor HP 8481A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
ower meter EPM-442A ower sensor HP 8481A ower sensor HP 8481A beference 20 dB Attanuator	GB37480704 US37292783	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827)	Oct-14 Oct-14
ower meter EPM-442A ower sensor HP 8481A ower sensor HP 8481A serence 20 dB Attenuator ype-N mismatch combination	GB37480704 US37292783 MY41092317	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828)	Oct-14 Oct-14 Oct-14
ower meter EPM-442A lower sensor HP 8481A lower sensor HP 8481A leference 20 dB Attenuator lype-N mismatch combination leference Probe ES3DV3	GB37480704 US37292763 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736)	Oct-14 Oct-14 Oct-14 Apr-14
ower meter EPM-442A lower sensor HP 8481A lower sensor HP 8481A leference 20 dB Attenuator lype-N mismatch combination leference Probe ES3DV3	GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14
ower meter EPM-442A lower sensor HP 8481A lower sensor HP 8481A leference 20 dB Attenuator lype-IN mismatch combination leference Probe ES3DV3	GB37480704 US37292763 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14
Ower meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 2D dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13) Check Date (in house)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check
Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 2D dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 JAE4 Recondary Standards RF generator R&S SMT-06	GB87480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14
Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 JAE4 Recondary Standards RF generator R&S SMT-06	GB87480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01738) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13) Check Date (in house)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Recondary Standards RF generator R&S SMT-06 Retwork Analyzer HP 8753E	GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01738) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14
Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Recondary Standards RF generator R&S SMT-06 Retwork Analyzer HP 8753E	GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01738) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601 Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14

Certificate No: D2450V2-747_Nov13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

FCC ID: L6ARHK210LW

2503A-RHK210LW

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Author Data Andrew Becker Dates of Test July 15 – Sept 21, 2015

RTS-6066-1509-15

Test Report No

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich. Switzerland





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

Accreditation No.: SCS 108

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

Glossary:

TSL tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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%.

BlackBerry

Appendix C for the BlackBerry \otimes Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data | Dates of Test | Test Report No | FCC ID: | IC |
Andrew Becker | July 15 - Sept 21, 2015 | RTS-6066-1509-15 | L6ARHK210LW | 2503A-RHK210LW

Measurement Conditions

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

DASY5	V52.8.7
Advanced Extrapolation	
Modular Flat Phantom	
10 mm	with Spacer
dx, dy, d2 = 5 mm	
2450 MHz ± 1 MHz	
	Advanced Extrapolation Modular Flat Phantom 10 mm dx, dy, dz = 5 mm

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	39.7 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	****	

SAR result with Head TSL

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.8 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.6 W/kg ± 16.5 % (k=2)



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data **Andrew Becker** Dates of Test **July 15 – Sept 21, 2015**

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$51.8 \Omega + 1.7 j\Omega$	
Return Loss	- 32.2 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.159 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	December 01, 2003	

Certificate No: D2450V2-747_Nov13

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Author Data | Dates of Test | Test Report No | FCC ID: | IC |
Andrew Becker | July 15 - Sept 21, 2015 | RTS-6066-1509-15 | L6ARHK210LW | 2503A-RHK210LW

∷ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

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Author Data **Andrew Becker** Dates of Test **July 15 – Sept 21, 2015** Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

DASY5 Validation Report for Head TSL

Date: 14.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 2450 MHz.

Medium parameters used: f = 2450 MHz; $\sigma = 1.84$ S/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

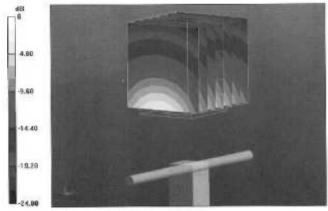
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.52, 4.52, 4.52); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

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 = 98.651 V/m; Power Drift = 0.07 dB Peak SAR (extrapolated) = 27.8 W/kg SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.17 W/kgMaximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dBW/kg

Certificate No: D2450V2-747_Nov13

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Author Data | Dates of Test | Test Report No | FCC ID: | IC |
Andrew Becker | July 15 - Sept 21, 2015 | RTS-6066-1509-15 | L6ARHK210LW | 2503A-RHK210LW



Author Data

Andrew Becker

July 15 – Sept 21, 2015

Appendix C for the BlackBerry® Smartphone Model RHK211LW

(STV100-1) SAR Report

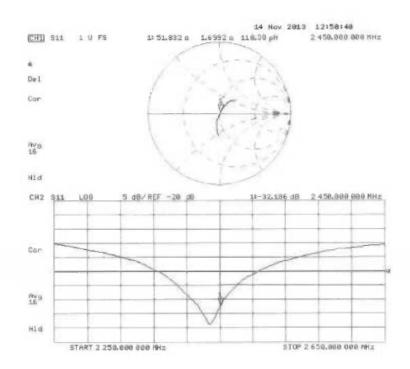
Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

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Impedance Measurement Piot for Head TSL

Dates of Test



Certificate No: D2450V2-747_Nov13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data **Andrew Becker**

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

2600 Dipole

Cali Prition Laboratory of Schrill & Partner En Gheering AG Zeugh autstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accreditation Service (SAS) The Sevis Accreditation Service is one of the signatories to the EA Multil^{st te}al Agreement for the recognition of calibration certificates

alibration procedure(s)	D2600V2 - SN: 1	033	
allbration procedure(s)			
	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
calibration date:	March 13, 2015		
The measurements and the unce	ertainties with confidence p	ional standards, which realize the physical un rebability are given on the following pages are ry facility; environment temperature $(22 \pm 3)^{\circ}$	id are part of the certificate.
Primary Standards	I ID#	Prof Piete In Laborate Inc.	Scheduled Calibration
ower meter EPM-442A	GB37480704	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020)	Oct-15
ower sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
ower sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Altenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
ype-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 801	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15
Secondary Standards	10.4	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
letwork Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15
	No.	Zvila	147.00
	Name	Function	Signature
	Jeton Kastrati	Laboratory Technician	1 (2
Calibrated by			

Certificate No: D2600V2-1033_Mar15

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*** BlackBerry

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

78(91)

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

2503A-RHK210LW

Cali Phtion Laboratory of Schr Till & Partner Err Sheering AG Zeugh Subtrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accreditation Service is one of the sign

The S^{avits} Accreditation Service is one of the signatories to the EA Multiperion Agreement for the recognition of calibration certificates

Glos sary:

TSL ConvF

N/A

tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- EC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

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 a	as the standard uncer	tainty of measurement
multiplied by the coverage I probability of approximately	actor k=2, which for a no	ormal distribution corre	esponds to a coverage

Certificate No: D2600V2-1033 Mar15

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Appendix C for the BlackBerry \otimes Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Med surement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zeom Scan Resolution	dx, dy, dz = 5 mm	
Fiequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Neminal Head TSL parameters	22.0 °C	39.0	1,96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) "C	37.2 ± 6 %	2.00 mho/m ± 6.%
Head TSL temperature change during test	< 0.5 °C	-600	-

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.1 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.0 W/kg ± 16.5 % (k=2)

Certificate No: D2600V2-1033_Mar15



Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

App endix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

48.7 Ω - 5.3 jΩ	
- 25.2 dB	

Gen eral Antenna Parameters and Design

and the state of t	
Electrical Delay (one direction)	1.152 ns
The state of the s	1102115

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

The dispose is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dispose. The antenna is therefore short-circuited for DC-signals. On some of the dispose, small end caps are added to the dispose 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 dispose length is still according to the Standard.

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

Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	March 03, 2009	

Certificate No: D2600V2-1033_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

DAS ¥5 Validation Report for Head TSL

Date: 13.03.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT = Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1033

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medi um parameters used: f = 2600 MHz; $\sigma = 2 \text{ S/m}$; $\varepsilon_r = 37.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

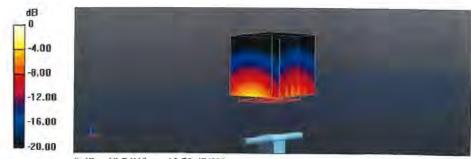
DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.49, 4.49, 4.49); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 101.6 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 30.3 W/kg SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.33 W/kg

Maximum value of SAR (measured) = 18.7 W/kg



0 dB = 18.7 W/kg = 12.72 dBW/kg

Certificate No. D2600V2-1033_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

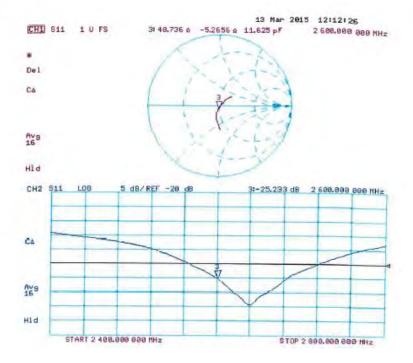
| 1

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1033_Mar15

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∷ BlackBe	erry	Appendix C for the (STV100-1) SAR R	e BlackBerry® Smartpho Report	ne Model RHK211L	W Page 83(91)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC
Andrew Becker	July 15	5 – Sept 21, 2015	RTS-6066-1509-15	L6ARHK210LW	2503A-RHK210LW

5000 Dipole

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data **Andrew Becker** Dates of Test

July 15 – Sept 21, 2015

Test Report No RTS-6066-1509-15 FCC ID: L6ARHK210LW

2503A-RHK210LW

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





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

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

Client Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D5GHzV2-1033_Nov13

ALIBNATION	ERTIFICATE		
Object	D5GHzV2 - SN: 1	033	
Calibration procedure(s)	QA CAL-22.v2 Calibration proces	dure for dipole validation kits bett	ween 3-6 GHz
Çalıbration date:	November 08, 20	13	
The measurements and the unca	rizinties with confidence p	onal standards, which realize the physical un robability are given on the following pages an	d are part of the certificate.
		y facility: environment tamperature (22 ± 3)°C	2 and humidity < 70%.
Calibration Equipment used (M&)	TE critical for calibration)		
Primary Standards	10 9	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01628)	Oct-14 Oct-14
Power sensor HP 8481A Reference 20 db Attenuator	MY41092317 SN: 5058 (20k)	08-Oci-13 (No. 217-01828) 04-Apr-13 (No. 217-01736)	Oct-14 Oct-14 Apr-14
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327	08-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739)	Oct-14 Oct-14 Apr-14 Apr-14
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12)	Oct-14 Oct-14 Apr-14 Apr-14 Dao-13
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327	08-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739)	Oct-14 Oct-14 Apr-1-4 Apr-14 Dao-13 Apr-14
Power sensor HP 8481A Power sensor HP 8481A Reference 20 db Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4 Secondary Standards	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apri3) Check Date (in house)	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13)	Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house chack: Oct-15
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dec-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apri3) Check Date (in house)	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house chack: Oct-15
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206	09-Oct-13 (No. 217-01826) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) 04-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13)	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by:	MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206 Name Claudio Leubler	09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01736) 28-Dac-12 (No. ES3-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apr13) Check Date (in house) D4-Aug-99 (in house check Oct-13) 18-Oct-01 (in house check Oct-13) Function Laboratory Technician	Oct-14 Oct-14 Apr-14 Apr-14 Dac-13 Apr-14 Scheduled Check In house check: Oct-15 In house check: Oct-14

Certificate No: D5GHzV2-1033_Nov13

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*** BlackBerry

Document

Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

Page **85(91)**

Author Data

Andrew Becker

Dates of Test

July 15 – Sept 21, 2015

Test Report No

RTS-6066-1509-15

FCC ID: L6ARHK210LW

w 250

2503A-RHK210LW

Calibration Laboratory of Schmid & Partner

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kallbrierdienst

C Service suisse d'étalonnage

Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

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) IEC 62209-2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"
- c) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

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: D5GHzV2-1033_Nov13

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Appendix C for the BlackBerry® Smartphone Model RHK211LW (STV100-1) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 15 – Sept 21, 2015**

Test Report No **RTS-6066-1509-15**

FCC ID: L6ARHK210LW

2503A-RHK210LW

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36,0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) "C	35.0 ± 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	7.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.4 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.6 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) "C	34.6 ± 6 %	4.75 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	-	-

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	84.4 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2,41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.9 W/kg ± 19.5 % (k=2)

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Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) "C	34.2 ± 6 %	5.06 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	8.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.4 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.6 W/kg ± 19.5 % (k=2)

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Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	49.1 Ω - 9.6 μΩ
Return Loss	- 20.3 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	50.3 Ω - 4.1 jΩ
Return Loss	- 27.7 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	57.8 (2 - 4.0)(2
Return Loss	- 21,8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1,213 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signats. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The 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	July 09, 2004

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DASY5 Validation Report for Head TSL

Date: 08.11.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz

Medium parameters used: f = 5200 MHz; σ = 4.46 S/m; $ε_r = 35$; ρ = 1000 kg/m³. Medium parameters used: f = 5500 MHz; σ = 4.75 S/m; $ε_r = 34.6$; ρ = 1000 kg/m³ Medium parameters used: f = 5800 MHz; σ = 5.06 S/m; $ε_r = 34.2$; ρ = 1000 kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.41, 5.41, 5.41); Calibrated: 28.12.2012, ConvF(4.91, 4.91, 4.91); Calibrated: 28.12.2012, ConvF(4.81, 4.81, 4.81); Calibrated: 28.12.2012;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8,7(1137); SEMCAD X 14.6.10(7164)

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 = 64.635 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 29.5 W/kg

SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.28 W/kg

Maximum value of SAR (measured) = 18.4 W/kg

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 = 64.397 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 33.8 W/kg

SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.41 W/kg

Maximum value of SAR (measured) = 20.3 W/kg

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 = 61.128 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 33.0 W/kg

SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.28 W/kg

Maximum value of SAR (measured) = 19.2 W/kg

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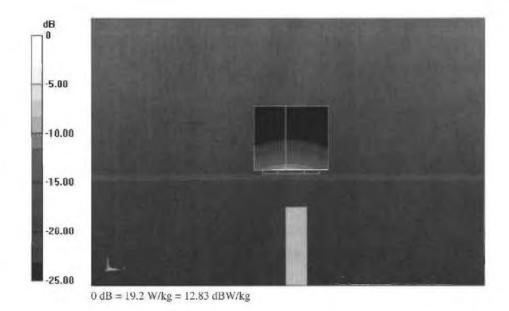
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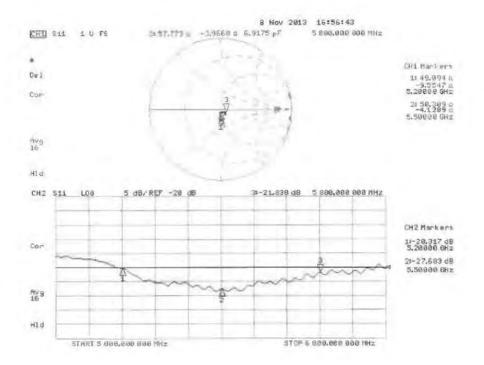
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Impedance Measurement Plot for Head TSL



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