Author Data
Andrew Becker

Document
Appendix C for the BlackBerry® Smartphone Model RHL211LW
(STV100-3) SAR Report

Test Report No
RTS-6066-1509-17
RTS-6066-1509-17

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FCC ID:
L6ARHL210LW
2503A-RHL210LW

APPENDIX C: PROBE & DIPOLE CALIBRATION DATA



Document

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

L6ARHL210LW

FCC ID:

2503A-RHL210LW

Probe 1643

Calbration Laboratory of Schweizerischer Kalibrierdignst Schmid & Partner Service sulese d'étalennage Engineering AG Zer/Snausstrasse 43, 8004 Zurich, Switzerland Servizio svizzero di taratura Swiss Calibration Service Accredited by the Swiss Accreditation Service (SAS) Accreditation No.: SCS 0108 The Wiss Accreditation Service is one of the signaturies to the EA Mulftiatoral Agreement for the recognition of calibration certificates Certificate No: ET3-1643_Mar15 **Blackberry Waterloo** CALIBRATION CERTIFICATE Object ET3DV6 - SN:1643 QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure(s) Calibration procedure for dosimetric E-field probes

Calibration date: March 13, 2015

This calibration certificate obscaments 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	MV41498087	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: 35277 (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 Proba ES3DV2	SN: 3013	38-Dec-14 (No. ES3-3013_Dec14)	Dec-15
DAE4	SN: 660	14-Jan-15 (No. DAE4-860 Jan15)	Jan-16
Secondary Standards	1D	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 chack: Oct-15

Name Function Signature
Calibrated by: Israe Elnadurg Labdratory Technician
Approved by: Katja Pokovic Tachnical Manager

Issued: March 13, 2015

This palibration cartificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: ET3-1643_Mar15

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Author Data

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Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Callbration Laboratory of Schnid & Partner Eligineering AG Zeu Blausstrasse 43, 8004 Zurich, Switzerland





S Schweizerlscher Kalibrierdienst
C Service suisse d'élaionnage
Servizio svizzero di taratura
Swiss Calibration Servica

Accreditation No.: SCS 0108

Appreciated by the Swiss Accreditation Service (SA9)

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

Glossary:

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

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

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

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

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

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
- 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 8 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz; R22 waveguide).
 NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z; A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f > 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (elpha, 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).

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

Probe ET3DV6

SN:1643

Manufactured: Calibrated:

November 7, 2001 March 13, 2015

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1643_Mar15

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Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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)
NO (μV/(V/m)2)A	1.76	1.95	1.75	± 10.1 %
DCP (mV)B	101.5	100.5	102.4	

Mcdulation Calibration Parameters

JID_	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc ^E (k=2)
)	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%.

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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 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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.

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Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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

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validity can be extended to ± 110 MHz.

F At frequencies below 3 GHz, the validity of tissue parameters (s and σ) 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 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

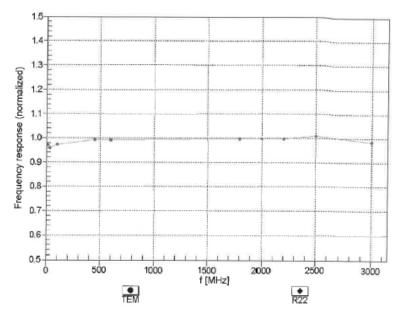
2503A-RHL210LW

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)



Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test

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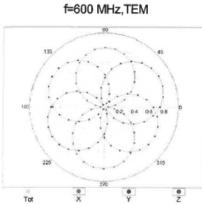
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2503A-RHL210LW

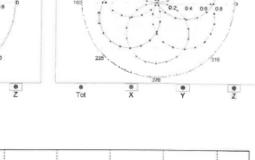
ET/30V6- SN:1643

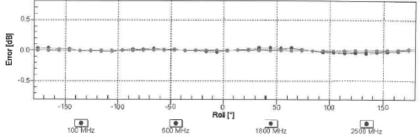
March 13, 2015

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



f=1800 MHz,R22





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

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(STV100-3) SAR Report

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Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

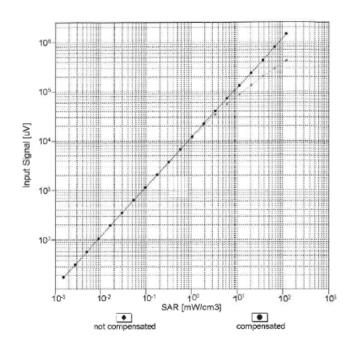
2503A-RHL210LW

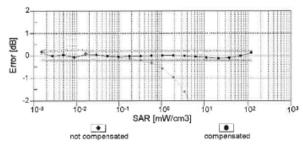
ET/30/v6~ SN:1643

March 13, 2015

Dynamic Range f(SAR_{head})

(TEM cell, feval= 1900 MHz)





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

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Author Data
Andrew Becker

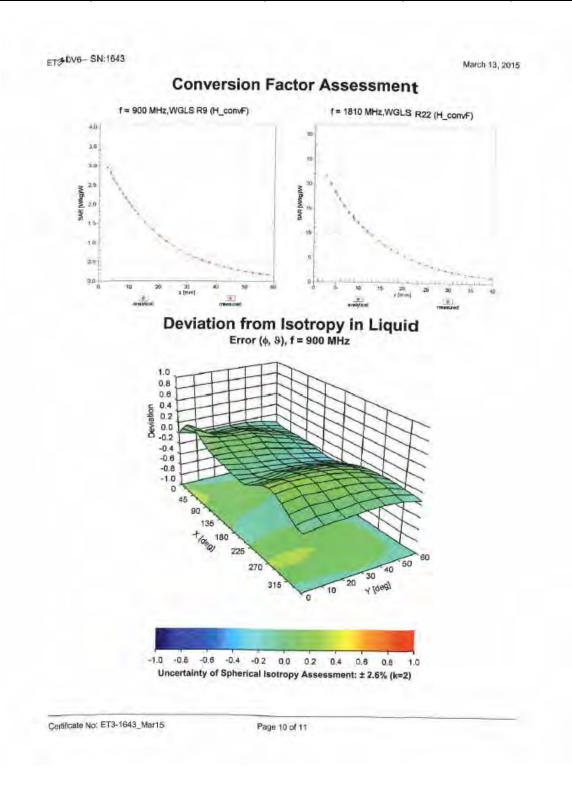
Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: I

2503A-RHL210LW





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Andrew Becker

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Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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
	4 111111

Certificate No: ET3-1643_Mar15

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Author Data	Dates of Te	est	Test Report No	FCC ID:	IC	
Andrew Becker July 22 – Sept 21, 2015 RTS-6066-1509-17 L6ARHL210LW 2503A-R						RHL210LW

Probe 3225

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Andrew Becker

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Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Ca libration Laboratory of Schmid & Partner En§ineering AG Zeu Shastrasse 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 Swas Accreditation Service is one of the signatories to the EA Mul^{≰ ilat}ral Agreement for the recognition of calibration certificates

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 E44198	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 (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

Function Laboratory Technician Calibrated by: Claudio Leubler Approved by: 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

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Ca litration Laboratory of Sc hit & Partner Engineering AG Zeu Shusstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Acc regited by the Swiss Accreditation Service (SAS)

The Siss Accreditation Service is one of the signatories to the EA Mud filteral Agreement for the recognition of calibration certificates

GI@%sary:

TSL-NO Rlix,y,z Corty? tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx,y,z diode compression point

DCIP CF A, Ø, D, D

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

Polarization φ

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
- 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:

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- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z; A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: ES3-3225 Feb15

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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

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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 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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 released to ± 10% if liquid compensation formula is applied to

Certificate No: ES3-3225_Feb15

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At requences elected 3 GHz, the validity of issue parameters (c and o) can be reased to 2 Hz/s it rights compensation formula is applied to the assert ASR values. At frequencies above 3 GHz, the validity of tissue parameters (s and o) 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 by diameter from the boundary.



Document

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

19(89)

Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

ES (* 013 - 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 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 has extended in ± 110 MHz.

Certificate No: ES3-3225_Feb15

Page 6 of 11

validity can be extended to ± 110 MHz.

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

headsold SNV between the following a first parameters.

Approximation for indicated target tissue parameters,

Approximation for indicated target tissue parameters.

Approximation for indicated target tissue parameters,

Approximat



20(89)

Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

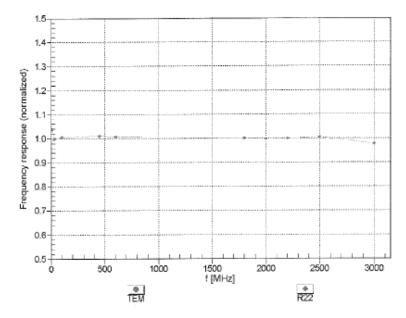
2503A-RHL210LW

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 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

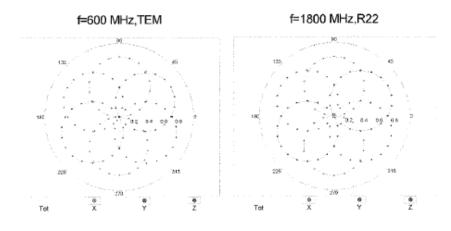
FCC ID: L6ARHL210LW

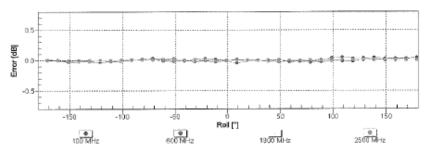
2503A-RHL210LW

ES# D/3- SN:3225

February 25, 2015

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





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

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

Page **22(89)**

Author Data
Andrew Becker

Dates of Test

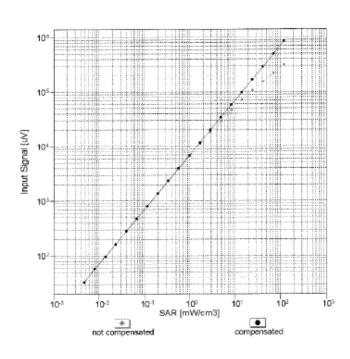
July 22 – Sept 21, 2015

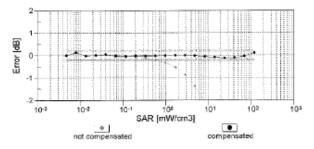
Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

(TEM cell , feval= 1900 MHz)





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



Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

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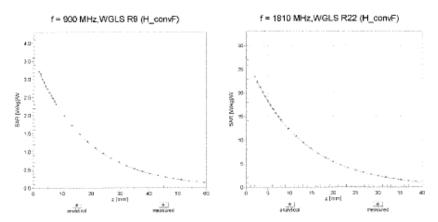
Author Data **Andrew Becker** Dates of Test July 22 – Sept 21, 2015 Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

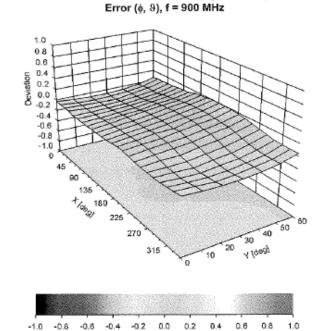
ES 20/3-SN:3225

February 25, 2015

Conversion Factor Assessment



Deviation from Isotropy in Liquid



Certificate No: ES3-3225_Feb15

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



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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

V 2503

2503A-RHL210LW

ESૐ^D3- SN:3225

February 25, 2015

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

Ot Probe Parameters

S@⊓or Arrangement	Triangular
Conjector Angle (°)	-61.4
Mechanical Surface Detection Mode	enabled
Optikal 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 (STV100-3) SAR Rep	BlackBerry® Smartphon port	ne Model RHL211LV	V	Page 25(89)
Author Data Dates of Test			Test Report No	FCC ID:	IC	
Andrew Becker	July 2	2 – Sept 21, 2015	RTS-6066-1509-17	L6ARHL210LW	2503A-R	HL210LW

Probe 3592

∷ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

26(89)

Author Data **Andrew Becker** Dates of Test

July 22 - Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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

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: EX3-3592_Nov14

Accreditation No.: SCS 108

CALIBRATION CERTIFICATE

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 traccability 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 (3c)	. 03 Apr-14 (No. 217-01915)	Apr-16
Reference 20 dB Attenuator	SN: S5277 (20x)	(3-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5*29 (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
Rt- generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr. 13)	In house check: Agr-16
Network Analyzer HP 8753F	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Left Klyaner	Laboratory Technician	Seef My
Approved by:	Katja Pukovic	Technical Manager	Re ag-
			Issued: November 10, 2014

Certificate No. EX3-3592_Nov14

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*** BlackBerry

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

Page **27(89)**

Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 φ o rotation around probe axis

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

i.e., 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:

 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

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 diode.
- ConvF and Boundary Effect Parameters: 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 * 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. EX3-3592 Nov14

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Appendix C for the BlackBerry \otimes Smartphone Model RHL211LW (STV100-3) SAR Report

Page **28(89)**

Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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) ^A	95,2	98.0	98.8		

Modulation Calibration Parameters

מוט	Communication System Name		A dB	B dBõV	C	dB	VR mV	Unc (k=2)
0	CW	×	0.0	0.0	1.0	0.00	145.9	±3.3 %
	10.00	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%

Certificate No: EX3-3592_Nov14

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⁵ The uncertainties of NormX, Y.Z do not affect the E² 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 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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 %

Errequency validity above 300 MHz of ± 100 MHz only applies for DASY v1.4 and higher (add Page 2), also it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at dailbration 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, 84, 128, 190 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 (s and or) 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 (c and or) 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 from ± 1% for frequencies aclow 3 GHz and below ± 2% for frequencies between 3-8 GHz at any distance larger than half the probe to diameter from the boundary.

Certificate No. EX3-3592 Nov14

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diameter from the boundary.



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Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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 (c and c) can be released to ± 10% if liquid compansation formula is applied to

Certificate No: EX3-3592_Nov14

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At frequencies below 3 GHz, the validity of tissue parameters (clandic) can be relaxed to ± 10% if liquid compansation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (clandic) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated larger its issue 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 heliow ± 2% for frequencies between 3.6 GHz at any distance larger than half the probe lip claimater from the boundary.



Page **32(89)**

Author Data
Andrew Becker

Dates of Test **July 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

EX3DV4- 5N:3592

November 10, 2014

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

4.5 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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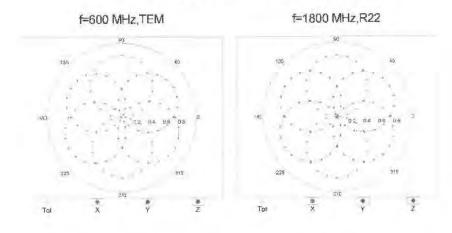
Author Data **Andrew Becker** Dates of Test July 22 – Sept 21, 2015 Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

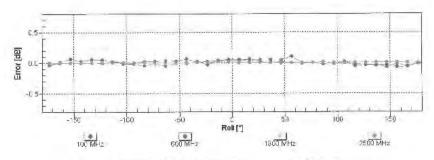
2503A-RHL210LW



November 10, 2014

Receiving Pattern (4), 9 = 0°





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 RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID:

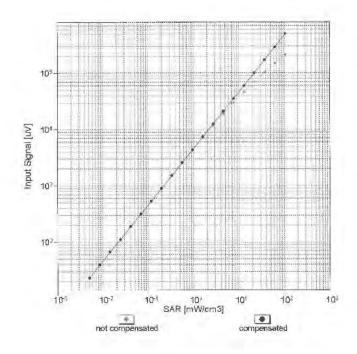
L6ARHL210LW

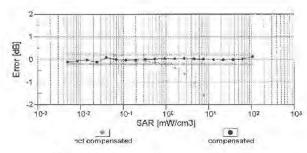
2503A-RHL210LW

EX3DV4 SN:3592

November 10, 2014

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





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

Certificate No: EX3-3592 Nov14

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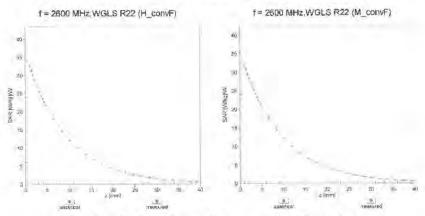
Author Data **Andrew Becker** Dates of Test July 22 – Sept 21, 2015 Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

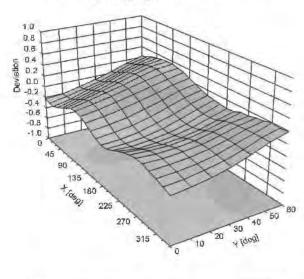
EX3DV4-SN:3592

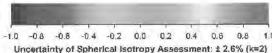
November 10, 2014

Conversion Factor Assessment



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





Certificate No: EX3-3592_Nov14

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 m		
Tip Length	9 mm		
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		

Certifinate No: EX3-3592_Nov14

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Appendix C for the BlackBerry \otimes Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 22 – Sept 21, 2015**

RTS-6066-1509-17

FCC ID: 1
L6ARHL210LW 2

2503A-RHL210LW

750 Dipole

Test Report No

Calibration Laboratory of Schmid & Partner En Cheering AG Zeugher strasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accred High by the Swiss Accreditation Service (SAS)

The Sw^{*}lis Accreditation Service is one of the signatories to the EA Multils* te_{al} 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 (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 humiday < 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 HF 6481A 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 Probé 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 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: Oct-15 Network Analyzer HP 8753E US37390585 S4205 18-Oct-01 (in house check Oct-14) In house check: Oct-15 Name Function Calibrated by: Michael Weber Laboratory Technician Approved by: Katia Pokovic Technical Manager Issued: March 11, 2015 This call-tration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificat e No: D750V3-1021_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Calibation Laboratory of

Schn 1 & Partner En Pheering AG Zeugha Ustrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accredits by the Swiss Accreditation Service (SAS)

The SW^{*}le Accreditation Service is one of the signatories to the EA Multile ³that Agreement for the recognition of calibration certificates

Glossiry:

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
- 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%.

Certificat-e No: D750V3-1021_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test **July 22 – Sept 21, 2015**

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Mea∮rement 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)



Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test **July 22 – Sept 21, 2015**

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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	

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
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Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

DAS YS Validation Report for Head TSL

Date: 11.03.2015

Test Horatory: 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; $\sigma = 0.9$ S/m; $\epsilon_r = 40.8$; p = 1000 kg/m³

Phantom section: Flat Section

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

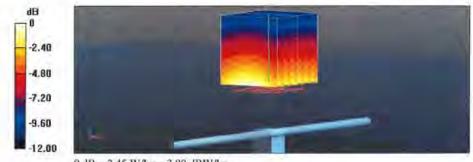
DAS Y52 Configuration:

- 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 RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

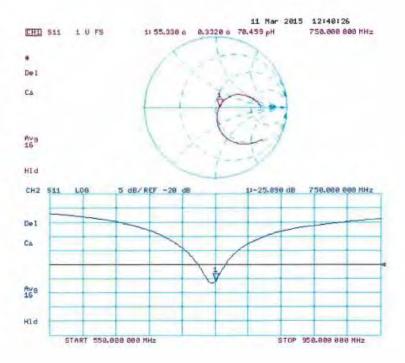
July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

Imperiance Measurement Plot for Head TSL



Certificate No: D750V3-1021_Mar15

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*** BlackBerry	/	Appendix C for the B (STV100-3) SAR Rep	BlackBerry® Smartphon port	ne Model RHL211LV	V	Page 43(89)
Author Data	Dates of Te	Test Report No FCC ID: IC				
Andrew Becker	July 2	2 – Sept 21, 2015	RTS-6066-1509-17	L6ARHL210LW	2503A-R	RHL210LW

835 Dipole

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Appendix C for the BlackBerry $\mbox{\ensuremath{\mathbb{B}}}$ Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

CaliPlation Laboratory of Schr d & Partner En Sneering AG Zeugh Statasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
C Service sulsse d'étalonnage
Servizio svizzero di teratura
S 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
Muttile is al Agreement for the recognition of calibration certificates

Client Blackberry Waterloo

Certificate No: D835V2-446_Mar15

	ERTIFICATE		
Object	D835V2 - SN:446	3	
Calibration procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date:	March 11, 2015		
This cellbration certificate docum The measurements and the unce	ents the traceability to nati enainties with confidence p	onal standards, which realize the physical un robability are given on the following pages ar	its of measurements (SI), id are part of the certificate.
All calibrations have been condu	cted in the closed laborator	ry facility: anvironment temperature (22 ± 3)*	C and humidity < 70%.
Calibration Equipment used (M&	TE entical (or calibration)		
	TE entical (or calibrátion)	Cal Date (Certificate No.)	Scheduled Calibration
Primary Standards Power meter EPM-442A	ID # GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Primary Standards Power meter EPM-442A Power sensor HP 8481A	ID # G837480704 US37292783	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020)	Oct-15 Oct-15
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A	ID # GB37480704 US37292783 MY41092317	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021)	Oct-15 Oct-15 Oct-15
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator	(D.# G837480704 US37292783 MY41092317 SN: 5058 (20K)	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918)	Oct-15 Oct-15 Oct-15 Apr-15
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 05327	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)	Oct-15 Oct-15 Oct-15 Apr-15 Apr-15
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Typo-N mismatch combination Reference Probe ESSDV3	(D.# G837480704 US37292783 MY41092317 SN: 5058 (20K)	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01918)	Oct-15 Oct-15 Oct-15 Apr-15
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 ESSIDV3 DAE4	ID.# GB37480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01921) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-0205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15
Primary Standards Power meter EPM-442A Power sensor HP 9481A Power sensor HP 9481A Reference 20 08 Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4 Secondary Standards	ID # G837480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	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) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (In house)	Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check
Primary Standards Power meter EPM-442A Power sensor HP 8481A Perimary Standards Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	ID # G837480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-01921) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. ES3-0205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16
Primary Standards Power meter EPM-442A Power sensor HP 8481A Perimary Standards Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06	ID.# GB37480704 US37292783 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. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-02021) 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 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16
Primary Standards Power meter EPM-442A Power sensor HP 9481A Power sensor HP 9481A Pelerence 20 dB Attenuator Type-N mismatch combination Pelerance Probe ES3DV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	ID.# GB37480704 US37282783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 \$4206	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-02021) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. E83-9205_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 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15
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 RF generator R&S SMT-06 Network Analyzer HP 8753E	ID.# GB37480704 US37292783 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. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-02021) 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 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15 Scheduled Check In house check: Oct-16
Primary Standards Power meter EPM-442A Power sensor HP 9481A Power sensor HP 9481A Reference 20 dB Attenuator Typo-N mismatch combination Reference Probe ESSDV3	ID.# GB37480704 US37282783 MY41092317 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 \$4206	07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 03-Apr-14 (No. 217-02021) 03-Apr-14 (No. 217-01921) 30-Dec-14 (No. E83-9205_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 Oct-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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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Califration Laboratory of

SchrTid & Partner Er#9ineering AG Zeughr⁸sstrasse 43, 6004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Agend 4d by the Swies Accorditation Service (SAS)

The S^Mss Accreditation Service is one of the signatories to the EA Multil ^{Abrel} Agreement for the rocognition 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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head Irom 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 multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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Appendix C for the BlackBerry $\$ Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID:

L6ARHL210LW 2

2503A-RHL210LW

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 cm3 (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 RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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€¹al 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 "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 24, 2001

Certificate No: D835V2-446 Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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

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

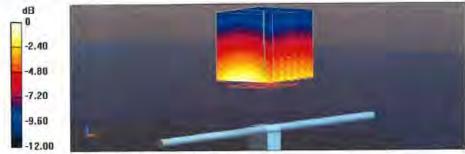
DAS \$52 Configuration:

- 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 RHL211LW (STV100-3) SAR Report

49(89)

Author Data **Andrew Becker**

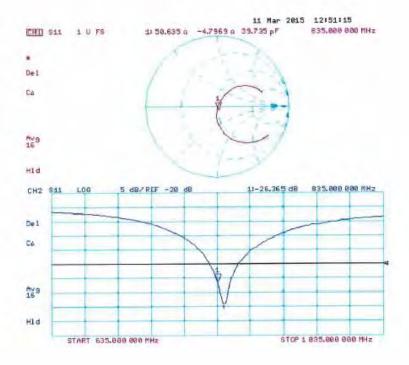
Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Imperance Measurement Plot for Head TSL



Certificate No: D835V2-446_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

Fage **50(89)**

Author Data
Andrew Becker

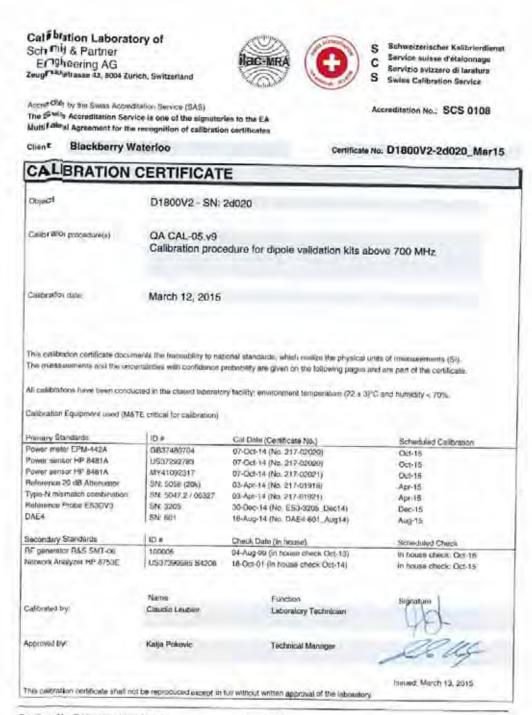
Dates of Test **July 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

1800 Dipole



Certificate N o: D1800V2-2d020_Mar15

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Appendix C for the BlackBerry \otimes Smartphone Model RHL211LW (STV100-3) SAR Report

51(89)

Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Cali bration Laboratory of

Schmid & Partner
Empineering AG
Zeug Passatrasse 43, 8004 Zersch, Switzerland





S Schweizerischer Kniltzferdionat
C Scrvice suisse d'étakonnege
Sorvizio svizzaro di taratura
Swiss Calibration Service

Accommitation No.: SCS 0108

According by the Swiss Accordance thereby (SAS)

The Swiss Accordington Service is one of the Eignaturies to the EA

Mutil Faleral Agreement for the recognition of calibration pertitionies

Glossary:

TSL Con VF

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 52209-1, "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)".
- 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 Paramoters 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 priented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
 positioned under the liquid filled phantom. The impedance stated is transformed from the
 measurement at the SMA connector to the feed point. The Return Loss ensures low
 reflected power. No uncertainty required.
- Electrical Delay; One-way delay between the SMA connector and the antenna feed point.
 No uncertainty required.
- · SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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

Certificate No. D1900V2-2d020, Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17

10 mm

FCC ID: L6ARHL210LW

V52.68

with Spacer

2503A-RHL210LW

Med Strement Conditions

DALY system contiguration, as far as not given on page DASY Version DASY5 Estrapolation Advanced Extrapolation Plantom Modular Flat Phantom Distance Dipole Center - TSL

Zeam Scan Resolution dx. dy. dz = 5 mm Frequency 1800 MHz + 1 MHz

Head 7SL parameters

The blowing 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 D ± 0.2) °C	39.1 ± 6 %	1.41 mbg/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ⁴ (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 % (ka2)

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	26.2 W/kg ± 16.5 % (ku-2)

Certifican No; D1800V2-2d020_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

53(89)

Author Data **Andrew Becker** Dates of Test **July 22 – Sept 21, 2015** Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

impedance, transformed to feed point	45.8 \(\O + 8.4 \(\D \)
Return Loss	
	-20,2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.215 ns

After Tong 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 fending line is directly connected to the second arm of the dipole. The antenna is therefore chort-circuited for DC-signals. On some of the dipoles, small and 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 uffected by this change. The overall (Roote length is still according to the Standard.

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 07, 2001

Certificate No: D1800V2-20020_Mar15

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∷ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker** Dates of Test

July 22 - Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

Date: 12.03,2015

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

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

Medium parameters used: f = 1800 MHz; $\sigma = 1.41 \text{ S/m}$; $\epsilon_r = 39.1$; $\rho = 1000 \text{ kg/m}^4$

Plum 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(1g) = 9.71 W/kg; SAR(10g) = 5.08 W/kgMaximum 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 RHL211LW (STV100-3) SAR Report

Page **55(89)**

Author Data
Andrew Becker

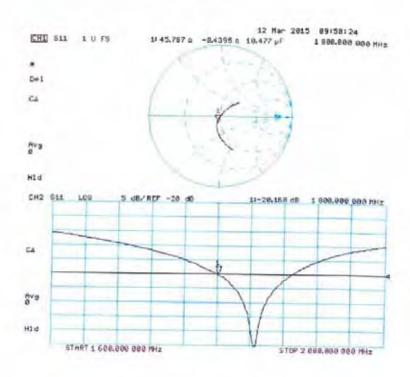
Dates of Test **July 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW





Certificate No: D1800V2-2d020_Mar15

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1900 Dipole

Document

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Cali bration Laboratory of Schmid & Partner

Schmid & Panner
Engineering AG
Zeugrausstrasse 43, 8004 Zurich, Switzerland





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

Accredited by the Swiss Accreditation Service (SAS)

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

Multifeleral Agreement for the recognition of calibration certificates

Blackberry Waterloo

Accreditation No.: SCS 0108

Certificate No: D1900V2-545_Mar15

CALIBRATION CERTIFICATE

Object

D1900V2 - SN:545

Calibration 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)

GB37480704	Cal Date (Certificate No.)	
	07-Oct-14 (No. 217-02020)	Scheduled Calibration Oct-15
US37292783	07-Oct-14 (No. 217-02020)	Oct-15
MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
SN: 5058 (20k)		Apr-15
SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
SN: 3205	30-Dec-14 (No. ES3-3205 Dec14)	Dec-15
SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15
ID #	Check Date (In house)	Scheduled Check
100005		In house check: Oct-16
US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check; Oct-15
Name	Function	Signature
Ctaudio Laubler	Laboratory Technician	Signature
Katja Pokovic	Technical Manager	00111
	SN: 5058 (20x) SN: 5047,2 / 06327 SN: 3205 SN: 601 ID 4 100005 US37390585 S4206 Name Claudio Laubler	SN: 5058 (20k) 03-Apr-14 (No. 217-01915) SN: 5047 (2 / 06327 03-Apr-14 (No. 217-01921) SN: 3205 30-Dec-14 (No. ES3-3205_Dec14) SN: 601 18-Aug-14 (No. DAE4-601_Aug14) ID a Check Data (In house) 100005 04-Aug-99 (in house check Oct-13) US37390585 S4206 18-Oct-01 (in house check Oct-14) Name Function Claudio Laubler Laboratory Technician

Certificate No: D1900V2-545_Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

57(89)

Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Cal bration Laboratory of Sch mid & Partner

Emgineering AG Zeug Frausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Acces cited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL

tissue simulating liquid

Con VF 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 llat 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 RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker**

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Me@surement Conditions

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

ASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy , $dz = 5$ mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters
The following parameters and calculations were applied.

A residence of the 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 ± 6 %
Head TSL temperature change during test	< 0.5 °C	100	***

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 RHL211LW

(STV100-3) SAR Report

59(89)

Author Data **Andrew Becker** Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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 I chig 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-directled for DC-signals. On some of the dipoles, small end caps are acided 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 dipote length is shift 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

Certificals No. D1900V2-545_Mar15

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Document

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

Date: 12.03.2015

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

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

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

Pharatom section: Flat Section

Measurement 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/kg Maximum value of SAR (measured) = 12.1 W/kg





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Author Data
Andrew Becker

Dates of Test

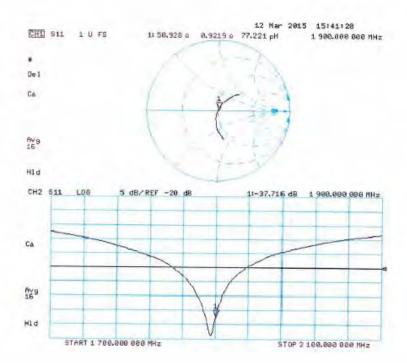
July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

Impredance Measurement Plot for Head TSL



Certificate No: D1900V2-545_Mar15

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### BlackBerry	/	Appendix C for the B (STV100-3) SAR Rep	lackBerry® Smartphor ort	ne Model RHL211LV	V	Page 62(89)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 2	2 – Sept 21, 2015	RTS-6066-1509-17	L6ARHL210LW	2503A-R	HL210LW

2450 Dipole

≅ BlackBerry

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

63(89)

Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

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





5 Service suisse d'étalonnago 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

Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D2450V2-791_Sep13

Object	D2450V2 - SN; 7		
Calibration procedure(s)	QA CAL-05.v9 Calibration proce	dure for dipole validation kits abo	ove 700 MHz
Calibration date;	September 10, 20	013	
The measurements and the unce All calibrations have been condu	rtaintles with confidence proceed in the closed laborator	orial standards, which realize the physical un robability are given on the following pages an y facility: environment temperature (22 \pm 3) $\%$	d are part of the certificate.
Calibration Equipment used (M&	FE critical for calibration)		
Primary Standards	ID#	Cal Date (Certificate No.)	Scheduled Calibration
	ID# GB37480704	Cal Date (Certificate No.) 01-Nov-12 (No. 217-01690)	Scheduled Calibration Oct-13
Power mater EPM-442A		7	Oct-13 Oct-13
Power meter EPM-442A Power sensor HP 8481A	GB37480704 US37292763 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
Power meter EPM-442A Power sonsor HP 8481A Reference 20 dB Attenuator	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327	01-Nov-12 (No. 217-01640) 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
Power meter CPM-442A Power scrisor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205	01-Nov-12 (No. 217-016/40) 01-Nov-12 (No. 217-016/40) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Doc-12 (No. ESS-3205_Dec12)	Oct-13 Oct-13 Apr-14 Apr-14 Dec-13
Power mater EPM-442A Power sensor HP 8481A Heference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327	01-Nov-12 (No. 217-01640) 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
Power mater EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205	01-Nov-12 (No. 217-016/40) 01-Nov-12 (No. 217-016/40) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Doc-12 (No. ESS-3205_Dec12)	Oct-13 Oct-13 Apr-14 Apr-14 Dec-13
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	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317	01-Nov-12 (No. 217-016/40) 01-Nov-12 (No. 217-016/40) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Doc-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. OAF1-601_Apr13) Chock Date (in house)	Oct-13 Oct-13 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check; Oct-13
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	GB37480704 US37292763 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-Doc-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. OAF4-601_Apr13) Chock Date (in house)	Oct-13 Oct-13 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check
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	GB37480704 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-Doc-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. OAF4-601_Apr13) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (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 Signature
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 RE generator R&S SMT-06 Network Analyzer HP 875SE	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3206 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-Doc-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. OAF4-601_Apr13) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (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 Signature
Primary Standards Power meter EPM-442A Power sensor HP 8481A Heference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A HE generator R&S SMT-06 Network Analyzer HP 8753E Callibrated by:	GB37480704 US37292763 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S420B	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-Doc-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. OAF4-601_Apr13) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (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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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

Page **64(89)**

Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Calibration Laboratory of

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





S Schweizerischer Kalibrierdienst
C Service suisse d'étatonnage
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) 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 RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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)

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Author Data

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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(STV100-3) SAR Re

Dates of Test

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

1C 2503A-RHL210LW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56 1 Ω + 3.4 <u>jΩ</u>	
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

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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 M11z

Modium 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)

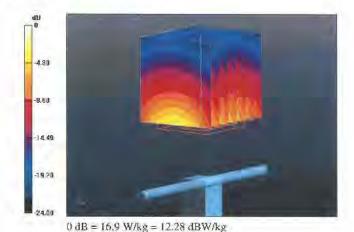
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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



Certificate No: D2450V2-791 Sep13

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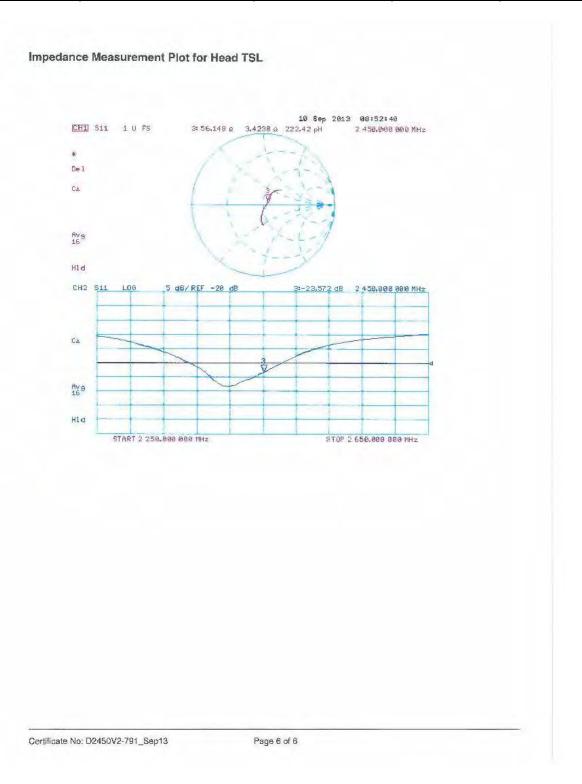


Appendix C for the BlackBerry® Smartphone Model RHL211LW

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(STV100-3) SAR Report

Author Data Dates of Test Test Report No FCC ID: July 22 – Sept 21, 2015 L6ARHL210LW 2503A-RHL210LW **Andrew Becker** RTS-6066-1509-17



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Appendix C for the BlackBerry $\$ Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

Calibration Laboratory of

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





S Schweizerischer Kalibrierdienst
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Accredited by the Swiss Accreditation Service (SAS)

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

Client Blac

Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D2450V2-747 Nov13

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	
This calibration certificate docum The measurements and the unce	ents the traceability to nat etainties with confidence p	ional standards, which realize the physical robability are given on the following pages	units of measurements (SI). and are part of the certificate.
All calibrations have been condu	cled in the closed laborato	ry facility: environment temperature (22 \pm 5	3)°C and humidity < 70%.
Calibration Equipment used (M&	TE critical for calibration)		
	TE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration
Primary Stendards		Cal Date (Certificate No.) 09-Oct-13 (No. 217-01827)	Scheduled Calibration Oct-14
Primary Standards Power meter EPM-442A	ID #		
Primary Standards Power meter EPM-442A Power sensor HP 8481A	ID # GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator	ID # GB37480704 US37292783	09-Oct-13 (No. 217-01827) 09-Oct-13 (No. 217-01827)	Oct-14
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ID # 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
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	ID # GB37480704 US37292783 MY41092317 SN: 5058 (20k)	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
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	ID # 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
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	ID ii GB\$7480704 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)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Dec-13
Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards	ID # 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-1-4
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 RF generator R&S SMT-06	ID # 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) Check Date (in house)	Oct-14 Oct-14 Oct-14 Apr-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check
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 DAE4 Secondary Standards RF generator R&S SMT-06 Natwork Analyzer HP 8753E	ID # 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. 217-01736) 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 Secondary Standards RF generator R&S SMT-06 Natwork Analyzer HP 8753E	ID # GBS7480704 US37292763 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) 26-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
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 RF generator R&S SMT-06	ID if GBS7480704 US37292783 MY41092317 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID if 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. 217-01736) 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) 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 RHL211LW

(STV100-3) SAR Report

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Author Data Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Calibration Laboratory of

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





Schweizerischer Kalibrierdienst C

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

Accreditation No.: SCS 108

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

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%.



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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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	39.7 ± 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)



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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
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Dates of Test

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FCC ID: L6ARHL210LW

2503A-RHL210LW

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

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

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July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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; $\sigma = 1.84 \text{ S/m}$; $\epsilon_r = 39.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.52, 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:

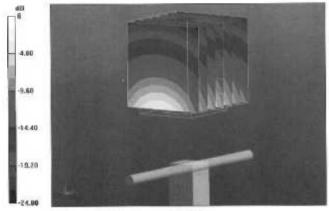
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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/kg

Maximum 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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(STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

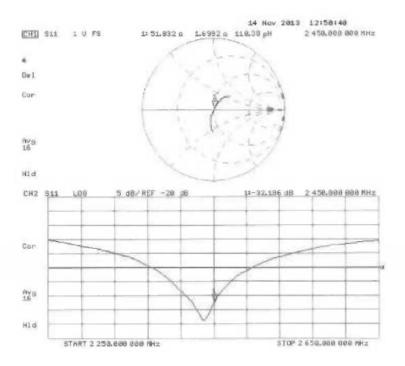
July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-747_Nov13

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Appendix C for the BlackBerry® Smartphone Model RHL211LW

(STV100-3) SAR Report

75(89)

Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

2600 Dipole

Cali Pration Laboratory of Schrid & Partner En Sheering AG Zeugh auistrasse 43, 8004 Zurich, Switzerland

Certificate No: D2600V2-1039_Mar15





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

Accreditation No.: SCS 0108

Accredible by the Swiss Accreditation Service (SAS)

The Swis Accreditation Service is one of the signatories to the EA.

Multip Ale Agreement for the recognition of calibration certificates

CALIBRATION	CERTIFICATE		
Object	D2600V2 - SN: 1	033	
Calibrativi procedure(s)	QA CAL-05.v9 Calibration proce	edure for dipole validation kits abo	ove 700 MHz
Calibration date:	March 13, 2015		
alibration Equipment used (M&		ry facility) environment temperature (22 ± 3)° Cal Date (Certificate No.)	
alibration Equipment used (M&	TE critical for calibration)	Cal Date (Certificate No.)	Scheduled Calibration Oct-15
alloration Equipment used (M& nimary Standards ower meter EPM-442A	TE critical for calibration)		Scheduled Calibration
alionation Equipment used (M& imary Standards ower mater EPM-442A ower sensor HP 8481A	TE critical for calibration) ID # GB37480704	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020)	Scrieduled Calibration Oct-15
alibration Equipment used (M& rimary Standards ower meter EPM-442A ower sensor HP 8481A ower sensor HP 8481A	TE critical for calibration) ID # GB37480704 US37292783	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020)	Scrieduled Calibration Oct-15 Oct-15
calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator	TE critical for calibration) ID # GB37480704 US37292783 MY41082317	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021)	Scheduled Calibration Oct-15 Oct-15 Oct-15
minimary Standards fower meter EPM-442A lower sensor HP 8481A lower sensor HP 8481A lower sensor HP 8481A lower sensor HP 8481A	ID # GB37480704 US37292783 MY41082317 BN: 5058 (20k)	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 09-Apr-14 (No. 217-01918)	Scrieduled Calibration Oct-15 Oct-15 Oct-15 Apr-15
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 (deference Probe ES3DV3	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 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) 09-Apr-14 (No. 217-01918) 03-Apr-14 (No. 217-01921)	Scrieduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15
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 telerance Probe ES3DV3	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 SN: 5056 (20k) SN: 5047.2 / 06327 SN: 3205	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-Occ-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 (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 DAE4	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 BN: 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. 217-0191) 30-Duc-14 (No. ES3-3205_Duc14) 18-Aug-14 (No. DAE4-601_Aug14) Check Date (in-house)	Scrieduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Apr-15 Dec-15 Aug-15 Scrieduled Check
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 DAE4 Secondary Standards RF generator R&S SMT-06	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 SN: 5056 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	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-Occ-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14)	Scrieduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Apr-15 Dec-15 Aug-15 Scrieduled Check In house check: Oct-18
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 ESSDV3 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 BN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005	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-Doc-14 (No. ES3-3205_Dec14) 18-Aug-14 (No. DAE4-601_Aug14) Cneck Date (in house)	Scheduled Calibration Oct-15 Oct-15 Oct-15 Apr-15 Apr-15 Dec-15 Aug-15
Calibration Equipment used (M& Primary Standards Power neter 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	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 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) 09-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) Cneck Date (in house) 04-Aug-99 (in house check Oct-13) 16-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 DAE4 Secondary Standards RF generator R&S SMT-06 Network Analyzer HP 8753E	TE critical for calibration) ID # GB37480704 US37292783 MY41082317 SN: 5056 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # 100005 US37390585 S4206 Name	Cal Date (Certificate No.) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02020) 07-Oct-14 (No. 217-02021) 09-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 (In house) 04-Aug-99 (in house check Oct-13) 16-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-18 In house check: Oct-18

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≅ BlackBerry

Ocument

Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Cali Phition Laboratory of Schr Titl & Partner Ers Sheering AG Zeigh Phistrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accreciable by the Swiss Accreditation Service (SAS)

The Swife Accreditation Service is one of the signatories to the EA Multiple to Agreement for the recognition of calibration certificates

Glossary:

TSL ConvF

N/A

tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "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: D2600V2-1033 Mar15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

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

Antenna Parameters with Head TSL

inpedance, transformed to feed point	48.7 Ω - 5.3 Ω
Return Loss	- 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	11.102.118

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-directly 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 "Measuterment Conditions" paragraph. The SAR data are not affected by this change. The overall dipole 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 RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID:

L6ARHL210LW

2503A-RHL210LW

DAS Y5 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)

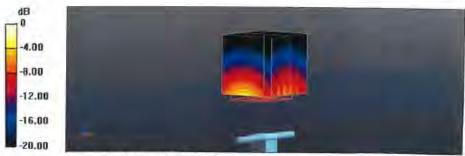
DASY52 Configuration:

- 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/kgMaximum 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 RHL211LW (STV100-3) SAR Report

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Author Data **Andrew Becker**

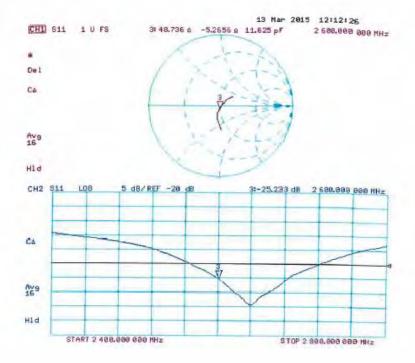
Dates of Test

July 22 – Sept 21, 2015

Test Report No RTS-6066-1509-17 FCC ID: L6ARHL210LW

2503A-RHL210LW

Impedance Measurement Plot for Head TSL



Certificate No: D2600V2-1033_Mar15

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### BlackBerry	/	Appendix C for the B (STV100-3) SAR Rep	lackBerry® Smartphor ort	ne Model RHL211LV	V	Page 81(89)
Author Data	Dates of Te	st	Test Report No	FCC ID:	IC	
Andrew Becker	July 2	2 – Sept 21, 2015	RTS-6066-1509-17	L6ARHL210LW	2503A-R	HL210LW

5000 Dipole

Document

Appendix C for the BlackBerry \otimes Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No

RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 Swiss Calibration Service

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

Client

Blackberry Waterloo

Accreditation No.: SCS 108

Certificate No: D5GHzV2-1033 Nov13

Object	D5GHzV2 - SN: 1		
Calibration procedure(s)	QA CAL-22.v2 Calibration proces	dure for dipole validation kits bet	ween 3-6 GHz
Calibration date:	November 08, 20	13	
The measurements and the unc	cartainties with confidence plucted in the closed laborator	onal standards, which realize the physical un robability are given on the following pages an y facility: environment temperature (22 \pm 3)°C	d are part of the certificate:
Primary Standards	1D 2	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704 US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205 SN: 601	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-Dac-12 (No. ESS-3205_Dec12) 25-Apr-13 (No. DAE4-601_Apri3)	Oct-14 Oct-14 Apr-14 Apr-14 Dao-13 Apr-14
Power sensor HP 8481A Seference 20 dB Attenuator Type-N mismatch combination Reference Probe ESSDV3 DAE4	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205	09-Oct-13 (No. 217-01828) 04-Apr-13 (No. 217-01736) 04-Apr-13 (No. 217-01739) 28-Dac-12 (No. ES3-3205_Dec12)	Oct-14 Apr-14 Apr-14 Dec-13
Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06827 SN: 3205 SN: 601	09-Oct-13 (No. 217-01628) 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)	Oct-14 Apr-14 Apr-14 Dac-13 Apr-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	MY41092317 SN: 5058 (20k) SN: 5047 3 / 06327 SN: 3205 SN: 601	08-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_Apri3) Check Date (in house check Oct-13)	Oct-14 Apr-14 Apr-14 Dec-13 Apr-14 Scheduled Check In house check: Oct-15

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data

Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

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RTS-6066-1509-17

FCC ID: L6ARHL210LW

2503A-RHL210LW

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kaltbrierdienst Service suisse d'étalonnage

C Servizio avizzero di taratura

Accreditation No.: SCS 108

Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL

tissue simulating liquid

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

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

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Appendix C for the BlackBerry® Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test **July 22 – Sept 21, 2015**

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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, d2 = 1.4 mm	Graded Batio = 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)

Certificate No: D5GHzV2-1033_Nov13



Appendix C for the BlackBerry \otimes Smartphone Model RHL211LW (STV100-3) SAR Report

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Author Data
Andrew Becker

Dates of Test

July 22 – Sept 21, 2015

Test Report No **RTS-6066-1509-17**

FCC ID: L6ARHL210LW

2503A-RHL210LW

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 (2 - 9.6 jt)
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 12 - 4.0 jt2
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-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	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

Medium parameters used: f = 5200 MHz; $\sigma = 4.46 \text{ S/m}$; $\epsilon_r = 35$; $\rho = 1000 \text{ kg/m}^3$. Medium parameters used: f = 5500 MHz; $\sigma = 4.75$ S/m; $\epsilon_i = 34.6$; $\rho = 1000$ kg/m³ Medium parameters used: $\Gamma = 5800 \text{ MHz}$; $\sigma = 5.06 \text{ S/m}$; $\epsilon_r = 34.2$; $\rho = 1000 \text{ kg/m}^3$

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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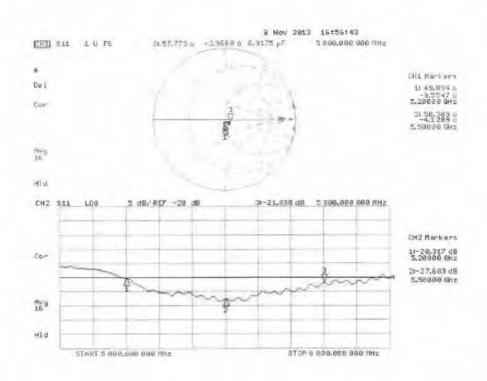
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Impedance Measurement Plot for Head TSL



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