Testing Services	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report				
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-1	RDR60CW

L6ARDF30CW

2503A-RDF30CW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

August 31 – October 05, 2011



Author Data **Andrew Becker**

Dates of Test May 3 – June 28, 2011 August 31 - October 05, 2011

Test Report No	FCC ID:	IC ID
RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	L6ARDF30CW	2503A-RDF30CW

Calibration Laboratory of Schmid & Partner

Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



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Client **RTS (RIM Testing Services)** Certificate No: ES3-3225_Jan11

Accreditation No.: SCS 108

ALIDNATION	CERTIFICAT	E al second s	
Dbject	ES3DV3 - SN:3	225	
Calibration procedure(s)		QA CAL-23 v4 and QA CAL-25 v3 edure for dosimetric E-field probe	
			:::::::::::::::::::::::::::::::::::::
Calibration date:	January 13, 201	Henry Marine States and States	n an an Araban Taragan an Araban
The measurements and the unc	ertainties with confidence	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature (22 ± 3)*0	d are part of the certificate.
Calibration Equipment used (M8	TE critical for calibration)		
rimary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
ower sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
ower sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11
econdary Standards	ID#	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11
	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
	an astronomican		-t- fue
camravou vy.			
Approved by:	Katja Pokovic	Technical Manager	Le les

Certificate No: ES3-3225_ Jan11

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Author Data Andrew Becker

Dates of Test May 3 – June 28, 2011 August 31 – October 05, 2011

Test Report No	FCC ID:	IC ID
RTS-2604-1106-84A		2503A-RDR60CW 2503A-RDF30CW
	•	

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Glossary:

Q1000001.j1	
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	modulation dependent linearization parameters
Polarization ϕ	φ 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., 9 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORMx, 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 effect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx, v.z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z; A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report				
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011 August 31 – October 05, 2011	RTS-2604-1106-84A	L6ARDR60CW L6ARDF30CW		RDR60CW RDF30CW

January 13, 2011

Probe ES3DV3

SN:3225

Manufactured: Last calibrated: Recalibrated: September 1, 2009 December 11, 2009 January 13, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

ES3DV3 SN:3225

January 13, 2011

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	1.26	1.21	1.31	± 10.1%
DCP (mV) ⁸	102.1	100.8	99.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	С	VR mV	Unc ^t (k=2)
10000	CW	0.00	х	0.00	0.00	1.00	149.8	± 2.6 %
			Y	0.00	0.00	1.00	148.1	
			z	0.00	0.00	1.00	110.7	

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

^A The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

⁸ Numerical linearization parameter: uncertainty not required.

^c Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

ES3DV3 SN:3225

January 13, 2011

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

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvFX Co	nvFY Con	vF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	$41.9 \pm 5\%$	0.89 ± 5%	6.47	6.47	6.47	0.89	1.08 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.11	6.11	6.11	0.81	1.10 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.26	5.26	5.26	0.37	1.68 ± 11.0%
1950	± 50 / ± 100	$40.0 \pm 5\%$	1.40 ± 5%	4.98	4.98	4.98	0.48	1.51 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.60	4.60	4.60	0.52	1.54 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.52	4.52	4.52	0.53	1.58 ± 11.0%

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
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	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

ES3DV3 SN:3225

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

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz)	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X Co	nvFY Cor	ιvFΖ	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	$55.5 \pm 5\%$	0.96 ± 5%	6.30	6.30	6.30	0.76	1.17 ± 11.0%
900	± 50 / ± 100	$55.0 \pm 5\%$	1.05 ± 5%	6.12	6.12	6.12	0.72	1.20 ±11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.88	4.88	4.88	0.26	2.70 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.89	4.89	4.89	0.33	2.28 ±11.0%
2450	± 50 / ± 100	52.7 ± 5%	$1.95 \pm 5\%$	4.43	4.43	4.43	0.99	1.04 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.29	4.29	4.29	0.99	1.05 ± 11.0%

[©] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency

and the uncertainty for the indicated frequency band.

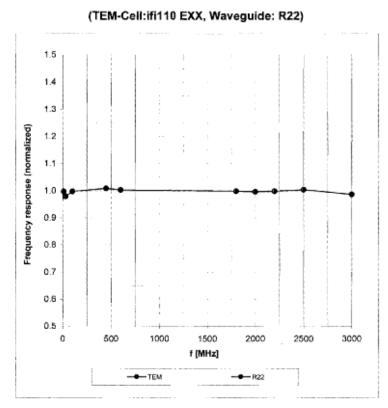
Certificate No: ES3-3225_Jan11

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January 13, 2011

Frequency Response of E-Field



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

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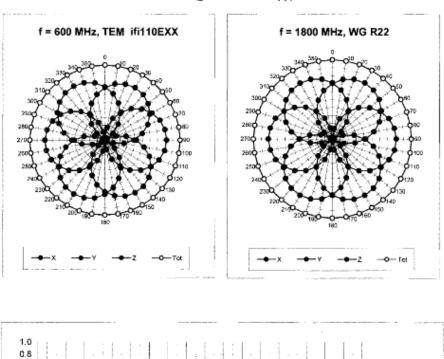
Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report			Page 9(41)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011 August 31 – October 05, 2011	RTS-2604-1106-84A	L6ARDR60CW L6ARDF30CW		RDR60CW RDF30CW

January 13, 2011

30 MHz

100 MHz 600 MHz 1800 MHz

-2500 MHz



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

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

180 \$["] 240

300

120

60

Certificate No: ES3-3225_Jan11

0.6 0.4

0.4 (Ep) 0.2 0.0

-0.4 -0.6

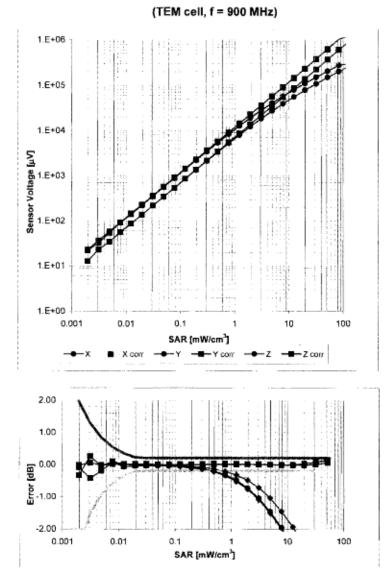
-0.8 -1.0 0

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Testing Services™	Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report				Page 10(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
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	August 31 – October 05, 2011		L6ARDF30CW	2503A-1	RDF30CW

January 13, 2011

Dynamic Range f(SAR_{head})



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

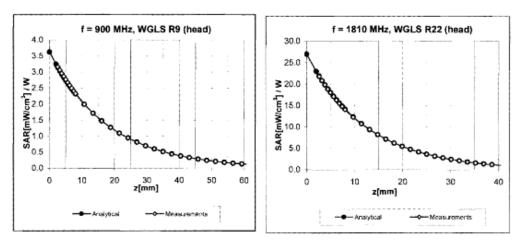
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Testing Services					Page 11(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-I	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-I	RDF30CW

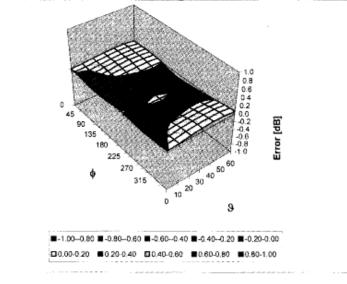
January 13, 2011



Conversion Factor Assessment

Deviation from Isotropy in HSL

Error (\$, 3), f = 900 MHz



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

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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
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Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

9	Calibration Laborator Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zuric	-			GNISS OF Z BU/BRATO	S C S	Schweizerischer Kalibrierd Service suisse d'étalonnag Servizio svizzero di taratur Swiss Calibration Service
1	Accredited by the Swiss Accredita The Swiss Accreditation Servio Multilateral Agreement for the r	e is one of the signator			Accredita	ation	No.: SCS 108
1	Client RTS (RIM Test	ing Services)			Certificat	e No	D835V2-446_Jan11
Į	CALIBRATION C	ERTIFICAT	E				
	Object	D835V2 - SN: 4	46	197			
	Calibration procedure(s)	QA CAL-05.v8 Calibration proc	edure for	r dipole v	alidation kits		
					-64.8		
	Calibration date:	January 21, 201	11				
	This calibration certificate docum The measurements and the unce	,					, ,
	All calibrations have been condu	cted in the closed laborat	tory facility: e	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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11
	Norma	F orting	
	Name	Function	Signature
Calibrated by:	Dimce Illey	Laboratory Technician	O. Silv
Approved by:	Katja Pokovic	Technical Manager	Le 13
This calibration certificate shall not	be reproduced except in	full without written approval of the laboratory	Issued: January 21, 2011
			-

Certificate No: D835V2-446_Jan11

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Author Data
Andrew Becker

Dates of Test May 3 – June 28, 2011 August 31 – October 05, 2011

Test Report No	FCC ID:	IC ID
RTS-2604-1106-84A		2503A-RDR60CW 2503A-RDF30CW
	Londered	

Calibration Laboratory of

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



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Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-F	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-F	RDF30CW

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	41.3 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(21.8 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 mW / g
SAR normalized	normalized to 1W	9.56 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.63 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.27 mW /g ± 16.5 % (k=2)

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.6 Ω - 7.7 jΩ
Return Loss	- 22.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 24, 2001

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-I	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-I	RDF30CW

DASY5 Validation Report for Head TSL

Date/Time: 21.01.2011 10:18:05

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Test Laboratory: SPEAG, Zurich, Switzerland

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

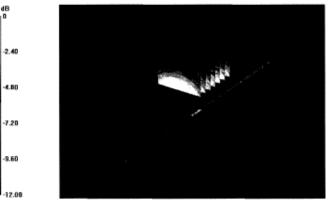
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL900 Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ϵ_r = 41.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.426 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 3.600 W/kg SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.56 mW/g Maximum value of SAR (measured) = 2.790 mW/g



 $0 \, dB = 2.790 \, mW/g$

Certificate No: D835V2-446_Jan11

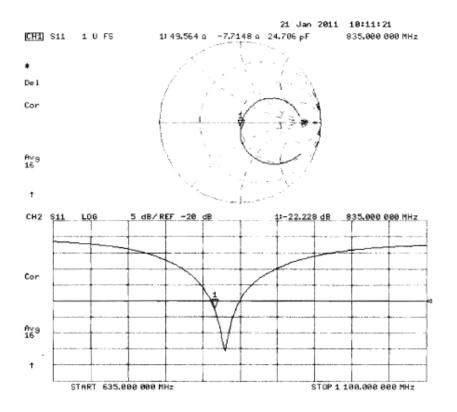
Page 5 of 6



2503A-RDF30CW

August 31 – October 05, 2011L6ARDF30CW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan11

Page 6 of 6

Data Iree Wecker Date of Test May 3 - June 28, 2011 August 31 - October 05, 2011 Test Report No RTS-2604-1106-84A CD Ds L6ARDR60CW E3203A-R Calibration Laboratory of Schmid & Partner Engineering AG Zeuphasetrase 4, 8004 Zuicht, Switzerland Description (SS) Schweitzerlacher Kalibrierdienst Service suisse of Balonnage Service Service Serv	W	RDR61CW/RDF31C	Smartphone Mode	ackBerry® S			翶
Schmid & Partner Engineering AG Zequipuestrasse 4, 8000 Zurich, Switzerstand Switze Suitzers of Hansung Switzer of Hansung Switzer of Hansung Switzer of Hansung Accessited by the Switz Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates Accessited by the Switzer of Hansung Switzer of Hansung Certificateral Agreement for the recognition of calibration certificates Certificate No: SCS 108 Certificate Agreement for the recognition of calibration certificates Certificate No: SCS 108 Certificate Agreement for the recognition of calibration certificates Certificate No: SCS 108 Certification procedure(s) CA CAL-05.v8 Calibration procedure(s) CA CAL-05.v8 Calibration procedure for clippide validation kits This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (s)). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All cattoration date: January 13, 2011 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (s)). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All cattoration Regiment used (MATE critical for calibration) Color 11 (do Color 10, 027-01269) Col 11 (do Col 11) Primary Standards D# Ca	 2503A-1	A L6ARDR60CW		5, 2011	8 – June 28, 2011	ew Becker May 3 – June	
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates Citent RTS (RIM Testing Services) Calibration Certificate Services Certificate No: D1800V2-2d020_dan1 Conject D1800V2 - SN: 2d020 Calibration procedure(s) CA CAL-05.v8 Calibration procedure for dipole validation kits Calibration certificate documents the traceability to national standards, which realize the physical units of measurements (S); The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 + 3)*C and humidity < 70%.		rvice suisse d'étalonnage rvizio svizzero di taratura	(c 🛡 z) C	Iac-MRA	-	chmid & Partner Engineering AG	S
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Approved by: Katja Pokovic Technical Manager		Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11 In house check: Oct-11 Signature	cate No.) 217-01266) 217-01266) 217-0158) 217-01162) 253-3205_Apr10) DAE4-601_Jun10) house) use check Oct-09) use check Oct-09) use check Oct-10) ction	Cal Date (Certifi 06-Oct-10 (No. 2 06-Oct-10 (No. 2 30-Mar-10 (No. 3 30-Mar-10 (No. 1 30-Apr-10 (No. 1 10-Jun-10 (No. 1 10-Jun-10 (No. 1 Check Date (in h 18-Oct-02 (in ho 18-Oct-01 (in ho	TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206	Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	C PRFFFD SPFF
Issued: January 13, 2011 This calibration certificate shall not be reproduced except in full without written approval of the laboratory.		Scheduled Calibration Oct-11 Oct-11 Mar-11 Mar-11 Apr-11 Jun-11 Scheduled Check In house check: Oct-11 In house check: Oct-11 In house check: Oct-11	cate No.) 217-01266) 217-01266) 217-0158) 217-01158) 217-01162) 253-3205_Apr10) DAE4-601_Jun10) house) use check Oct-09) use check Oct-09) use check Oct-10) ction oratory Technician	Cal Date (Certifi 06-Oct-10 (No. 2 06-Oct-10 (No. 2 30-Mar-10 (No. 2 30-Mar-10 (No. 1 10-Jun-10 (No. 1 10-Jun-10 (No. 1 10-Jun-10 (No. 1 18-Oct-02 (in ho 4-Aug-99 (in ho 18-Oct-01 (in ho Fun Lab	TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name Dimce lilev	Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by:	C PRPHIED SPEN C



Author Data Andrew Becker

Dates of Test May 3 – June 28, 2011 August 31 – October 05, 2011

Test Report No	FCC ID:	IC ID	
RTS-2604-1106-84A	L6ARDR60CW L6ARDF30CW		

Calibration Laboratory of

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



Schweizerischer Kalibrierdienst s Service suisse d'étalonnage

- С Servizio svizzero di taratura
- s 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

Glossarv:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. ٠ No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D1800V2-2d020 Jan11

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Accreditation No.: SCS 108



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.6 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.78 mW / g
SAR normalized	normalized to 1W	39.1 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	39.2 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.13 mW / g
SAR normalized	normalized to 1W	20.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.5 mW /g ± 16.5 % (k=2)



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.5 Ω - 7.3 jΩ
Return Loss	- 21.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.216 ns
, , , , , , , , , , , , , , , , , , , ,	

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

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



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-1	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-I	RDF30CW

DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 12:34:12

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Test Laboratory: SPEAG, Zurich, Switzerland

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

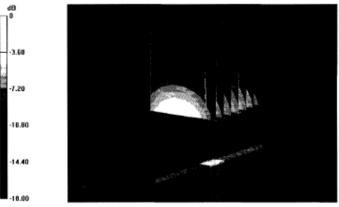
Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ϵ_r = 38.7; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.05, 5.05, 5.05); Calibrated: 30.04.2010
- · Sensor-Surface: 3mm (Mechanical Surface Detection)
- · Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- · Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW/d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.654 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 17.902 W/kg SAR(I g) = 9.78 mW/g; SAR(10 g) = 5.13 mW/g Maximum value of SAR (measured) = 12.051 mW/g

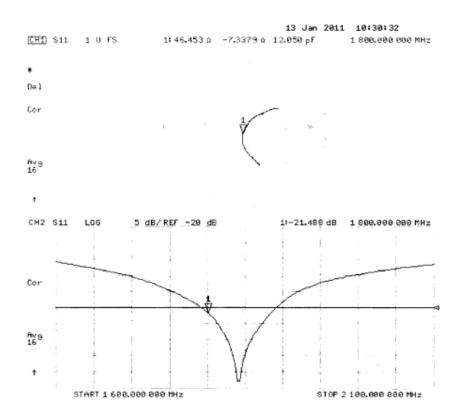


 $0 \, dB = 12.050 \, mW/g$

Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report Dates of Test Test Report No FCC ID: IC ID		Page 24(41)		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 - June 28 2011	RTS-2604-1106-844	L6ARDR60CW	25034-1	RDR60CW

Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Impedance Measurement Plot for Head TSL



Certificate No: D1800V2-2d020_Jan11Page 6 of 6This report shall NOTbe reproduced except in full without the written consent of RIM Testing ServicesCopyright 2005-2011, RIM Testing Services, a division of Research In Motion Limited



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Author Data **Andrew Becker**

Dates of Test May 3 – June 28, 2011 August 31 - October 05, 2011

Test Report No	FCC ID:	IC ID	
RTS-2604-1106-84A	L6ARDR60CW	2503A-1	RDR60CW
	L6ARDF30CW	2503A-1	RDF30CW

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



Schweizerischer Kalibrierdienst s Service suisse d'étalonnage С Servizio svizzero di taratura s 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 Accreditation No.: SCS 108

CALIBRATION C	erena a ser e come e com	Stream A. 1.45 (Stream) (Stream)	a: D1900V2-545_Jan11
Object	D1900V2 - SN: 5	45 - Faile and Annald Street Street	gan i star
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
Calibration date:	January 13, 201		
The measurements and the unce	rtainties with confidence p	lonal standards, which realize the physical un robability are given on the following pages ar ny facility: environment temperature $(22 \pm 3)^{\circ}$	d are part of the certificate.
Calibration Equipment used (M&	TE critical for calibration)		
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
ower sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
ype-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3 DAE4	SN: 3205 SN: 601	30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10)	Apr-11 Jun-11
	1010.001	10 0011-10 (10: 0012-001_00110)	501-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
ower sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	in house check: Oct-11
	Name	Function	Signature
Calibrated by:	Dince Rev	Laboratory Technician	D'Xiev
	the second second sector as a	Course with an ideal of a water water of the state side with the state of the	· · · · · · · · · · · · · · · · · · ·
Approved by:	Katja Pokovic	Technical Manager	Lo hay

Certificate No: D1900V2-545_Jan11 Page 1 of 6 Copyright 2005-2011, RIM Testing Services, a division of Research In Motion Limited



Author Data
Andrew Becker

Dates of Test May 3 – June 28, 2011 August 31 – October 05, 2011

Test Report No	FCC ID:	IC ID
RTS-2604-1106-84A		
	L6ARDF30CW	2503A-RDF30CW

Calibration Laboratory of

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



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Servizio svizzero di taratura Swiss Calibration Service

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Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

Certificate No: D1900V2-545_Jan11

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Accreditation No.: SCS 108



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.5 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR normalized	normalized to 1W	40.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	40.0 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.26 mW / g
SAR normalized	normalized to 1W	21.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.8 mW /g ± 16.5 % (k=2)



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω + 1.8 jΩ
Return Loss	- 34.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)		1.199 ns	

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 15, 2001

Certificate No: D1900V2-545_Jan11

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID	
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-1	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-I	RDF30CW

DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 14:52:49

Page 29(41)

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1900 MHz; $\sigma = 1.43$ mho/m; $\varepsilon_r = 38.6$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

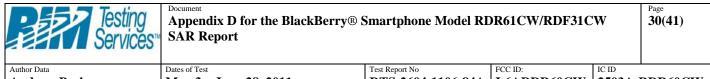
grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 98.053 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 18.648 W/kg SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.26 mW/g Maximum value of SAR (measured) = 12.743 mW/g



 $0 \, dB = 12.740 \, mW/g$

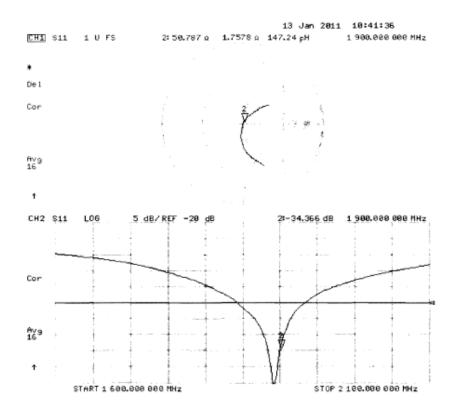
Certificate No: D1900V2-545_Jan11

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Author DataDates of restTest Report NoProc ID:IC IDAndrew BeckerMay 3 - June 28, 2011RTS-2604-1106-84AL6ARDR60CW2503A-RDR60CWAugust 31 - October 05, 2011ComparisonL6ARDF30CW2503A-RDF30CW

Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545_Jan11

Page 6 of 6

v Becker		June 28, 2011 1 – October 05, 2		Test Report No RTS-2604-1106-84A	FCC ID: L6ARDR60CW L6ARDF30CW	IC ID 2503A-RDR60 2503A-RDF30
Calibration La Schmid & Partr Engineering / Zeughausstrasse 43,	ner AG		Ibc mra	SNISS C P P P P SRATO S	Schweizerischer Kalibrier Service suisse d'étalonna Servizio svizzero di taratu Swiss Calibration Service	ge ira
	tion Service is	n Service (SAS) one of the signatories gnition of calibration of		Accreditation	No.: SCS 108	
Client RTS (F	RIM Testing	Services)	El el 17 a	Certificate No:	D2450V2-747_Nov	09
CALIBRAT	TION CE	RTIFICATE				
Object		D2450V2 - SN: 74	47	. 11 h . 1 h h	1 4 4 4 K C 1 2 4	8
Calibration procedure		QA CAL-05.v7 Calibration proces	dure for dipo	ole validation kits		
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Calibration date:	9	November 11, 20	09///////	C. F. U. M. M. M. S. S.	X	889
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This calibration certif The measurements a All calibrations have Calibration Equipmen Primary Standards Power meter EPM-44 Power sensor HP 84 Reference 20 dB Att Type-N mismatch co Reference Probe ES DAE4 Secondary Standard Power sensor HP 84 RF generator R&S S Network Analyzer HF	ticate documents and the uncertai been conducted nt used (M&TE 4 42A 481A enuator mbination 33DV3 18 481A 53T-06	s the traceability to natik inties with confidence pr d in the closed laborator critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	chal standards, v robability are give y facility: environ 06-Oct-09 (No 06-Oct-09 (No 31-Mar-09 (No 26-Jun-09 (No 07-Mar-09 (No 07-Mar-09 (No 07-Mar-09 (No 07-Mar-09 (No 07-Mar-09 (No 18-Oct-02 (in 18-Oct-02 (in 18-Oct-01 (in)	which realize the physical unit en on the following pages and iment temperature (22 ± 3)°C (17-01086) (217-01086) (217-01025) (217-01025) (217-01029)	d are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-10 Oct-10 Mar-10 Jun-10 Mar-10 Scheduled Check In house check: Oct-1 In house check: Oct-1 In house check: Oct-1	1

Testing Services™	Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report				Page 32(41)
Author Data	Dates of Test CID: IC ID				
Andrew Becker	May 3 – June 28, 2011 RTS-2604-1106-84A L6ARDR60CW 2503A-I				RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-1	RDF30CW



Author Data Andrew Becker

Dates of Test May 3 – June 28, 2011 August 31 – October 05, 2011

Test Report No	FCC ID:	IC ID	
RTS-2604-1106-84A			
	L6ARDF30CW	2503A-	RDF30CW

Calibration Laboratory of

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





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 - Swiss Calibration Service

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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

Glossary:

TSL	tissue simulating liquid
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Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. ٠ No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

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Accreditation No.: SCS 108

Testing Services™	Appendix D for the BlackBerry® Smartphone Model RDR61CW/RDF31CW SAR Report				Page 34(41)
Author Data	Dates of Test Test Report No FCC ID: IC ID				
Andrew Becker	May 3 – June 28, 2011 RTS-2604-1106-84A L6ARDR60CW 2503A-I				RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-	RDF30CW



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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Measurement Conditions

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

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	39.1 ± 6 %	1.78 mho/m ± 6 %
Head TSL temperature during test	(21.3 ± 0.2) °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 mW / g
SAR normalized	normalized to 1W	53.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	53.4 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.23 mW / g
SAR normalized	normalized to 1W	24.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.9 mW /g ± 16.5 % (k=2)

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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-	RDR60CW
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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.9 Ω + 0.9 jΩ	
Return Loss	- 33.9 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 ns
The second s	

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 01, 2003

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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-	RDF30CW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

DASY5 Validation Report for Head TSL

Date/Time: 11.11.2009 15:04:10

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Test Laboratory: SPEAG, Zurich, Switzerland

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

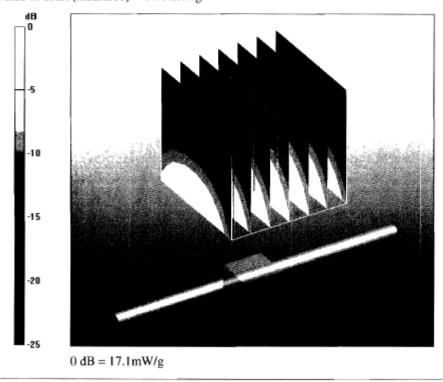
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: HSL U11 BB Medium parameters used: f = 2450 MHz; $\sigma = 1.79$ mho/m; $\varepsilon_r = 39.2$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 101.3 V/m; Power Drift = 0.067 dB Peak SAR (extrapolated) = 27 W/kg SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.23 mW/g Maximum value of SAR (measured) = 17.1 mW/g

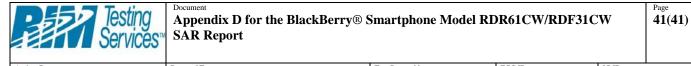


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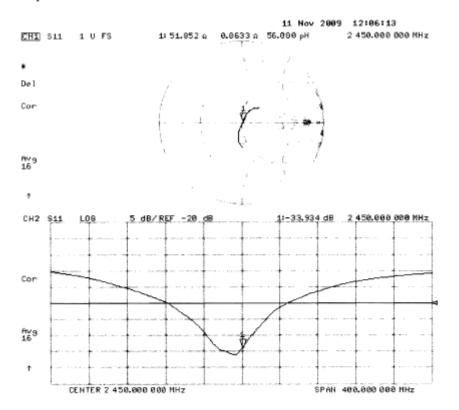
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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-1	RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-1	RDF30CW



Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84A	L6ARDR60CW	2503A-RDR60CW
	August 31 – October 05, 2011		L6ARDF30CW	2503A-RDF30CW

Impedance Measurement Plot for Head TSL



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