Testing Services™	Appendix D for the BlackB	Page 1(30)		
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

Services™				2(30)
^a w Becker	Dates of Test May 3 – June 28, 20	Test Report No RTS-2604-1106-84	FCC ID: L6ARDR60CW	IC ID 2503A-RDR600
Calibration Labor Schmid & Partner Engineering AG Zeughausstrasse 43, 8004	-	Hac MRA CRANKS S	Service suisse d'étalonnag Servizio svizzero di taratur	ge
	creditation Service (SAS) Service is one of the signatori r the recognition of calibration	es to the EA	n No.: SCS 108	
Client RTS (RIM	Testing Services)	Certificate N	o: ES3-3225_Jan11	
CALIBRATIC	N CERTIFICAT	E. Start		
Object	ES3DV3 - SN:3	225	Le Vallance a l'	
Calibration procedure(s)	Calibration proc	QA CAL-23.v4 and QA CAL-25.v3 edure for dosimetric E-field probe		
				1
Calibration date:	January 13, 201		its of measurements (SI)	
This calibration certificate The measurements and th All calibrations have been	documents the traceability to na e uncertainties with confidence conducted in the closed laborate	1 tional standards, which realize the physical un probability are given on the following pages ar ory facility: environment temperature $(22 \pm 3)^{\circ}$	nd are part of the certificate.	
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This calibration certificate The measurements and th All calibrations have been Calibration Equipment use Primary Standards	documents the traceability to na e uncertainties with confidence conducted in the closed laborate d (M&TE ontical for calibration)	tional standards, which realize the physical un probability are given on the following pages ar ory facility, environment temperature (22 ± 3)*(Cal Date (Certificate No.)	nd are part of the certificate. C and humidity < 70%. Scheduled Calibration	
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This calibration certificate The measurements and th All calibrations have been Calibration Equipment use Primary Standards Power meter E44198 Power sensor E4412A	documents the traceability to na e uncertainties with confidence conducted in the closed laborate d (M&TE critical for calibration) ID # GB41293874 MY41495277	tional standards, which realize the physical un probability are given on the following pages ar ory facility: environment temperature (22 ± 3)*(Cal Date (Certificate No.) 1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136)	nd are part of the certificate. C and humidity < 70%, Scheduled Calibration Apr-11 Apr-11	
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Andrew Becker

May 3 – June 28, 2011

RTS-2604-1106-84

NIS

BRD

60CW 2503A-RDR60CW

Calibration Laboratory of

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



S Schweizerischer Kalibrierdienst

C Service suisse d'etaionnage

Servizio svizzero di taratura Suiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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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	modulation dependent linearization parameters
Polarization o	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 ℜ = 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, 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.
- 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.

Certificate No: ES3-3225_Jan11

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Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW			Page 4(30)
Author Data	Dates of Test	IC ID		
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

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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January 13, 2011

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

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(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 ^E (k=2)
10000	cw	0.00	x	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%.

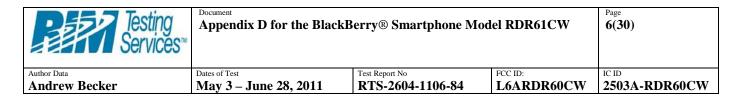
^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

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

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X Co	nvFY Com	vF Z	Aipha	Depth Linc (k=2)
750	± 50 / ± 100	41.9 ± 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%	$1.40 \pm 5\%$	5.26	5.26	5.26	0.37	1.68 ± 11.0%
1950	± 50 / ± 100	$40.0\pm5\%$	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	$39.0\pm5\%$	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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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 Con	vFZ	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 ± 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.

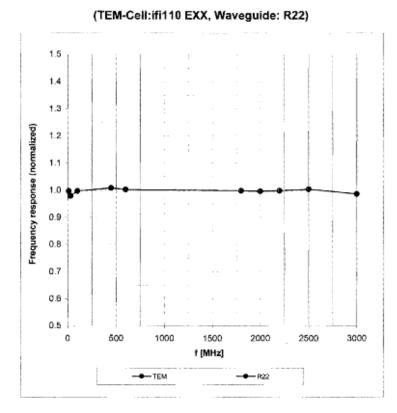
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Testing Services™	Appendix D for the Black	Page 8(30)		
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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

January 13, 2011

Frequency Response of E-Field



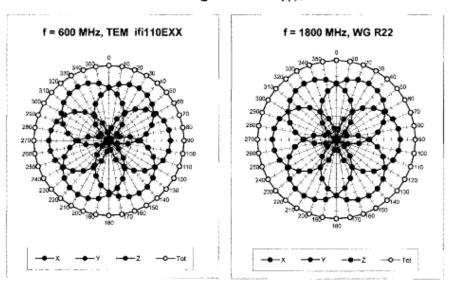
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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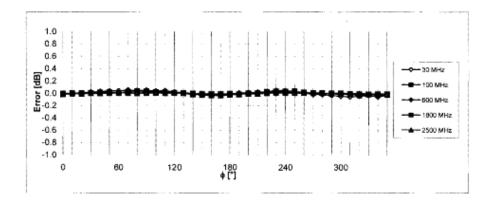
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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

January 13, 2011



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



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

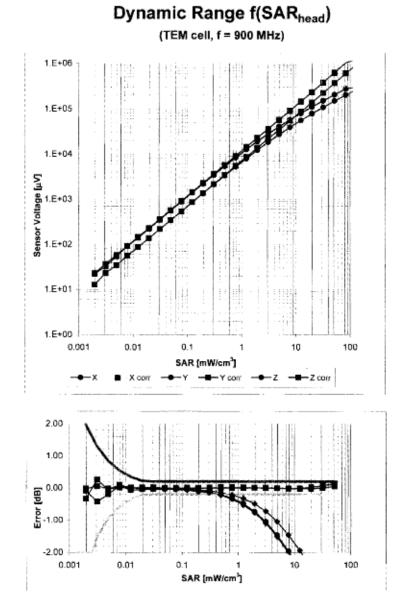
Certificate No: ES3-3225_Jan11

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Testing Services™	Document Appendix D for the BlackB	Page 10(30)		
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Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

January 13, 2011

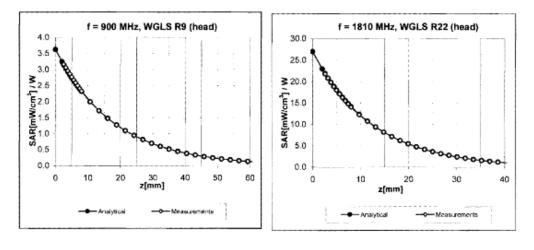


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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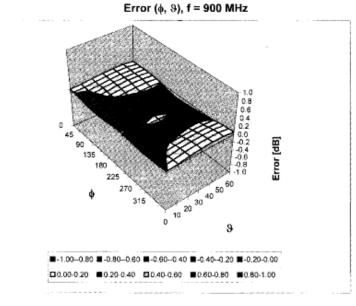


January 13, 2011



Conversion Factor Assessment

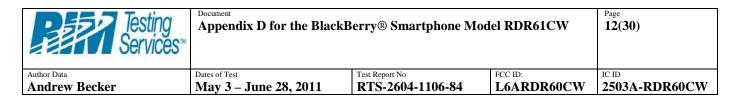
Deviation from Isotropy in HSL



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

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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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Andrew Becker

Dates of Test May 3 – June 28, 2011

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

IC ID 2503A-RDR60CW

Calibration	Laboratory of	

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



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

Accreditation No.: SCS 108

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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

lient RTS (RIM Test	ing Services)	Certificate N	lo: D835V2-446_Jan11
CALIBRATION C	ERTIFICATE		
Doject	D835V2 - SN: 44	6	
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	dure for dipole validation kits	
Calibration date:	January 21, 2011	n an 1841 - Garwert	
	r	ional standards, which realize the physical u robability are given on the following pages a	
Il calibrations have been conduc	cted in the closed laborator	ry facility: environment temperature (22 ± 3)	°C and humidity < 70%.
Calibration Equipment used (M&	TE critical for calibration)		
rimary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
ower 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
eference 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
eference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
AE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
econdary 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
F generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
letwork Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11
	Name	Function	Signature
alibrated by:	Dimce Illey	Laboratory Technician	O. Silv
Approved by:	Katja Pokovic	Technical Manager	Nin
-			por hig
			ssued: January 21, 2011

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

Certificate No: D835V2-446_Jan11

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Appendix D for the BlackBerry® Smartphone Model RDR61CW

Test Report No

Andrew Becker

Dates of Test May 3 – June 28, 2011

RTS-2604-1106-84

FCC ID: L6ARDR60CW

IC ID 2503A-RDR60CW

Calibration Laboratory of

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

Document





Schweizerischer Kalibrierdienst s

s

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) 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:

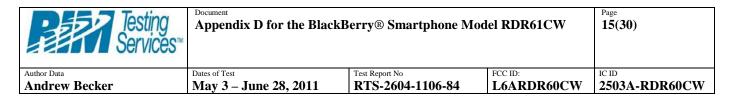
- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed ٠ point exactly below 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. ٠
- 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 ٠ nominal SAR result.

Certificate No: D835V2-446_Jan11

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

Accreditation No.: SCS 108

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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

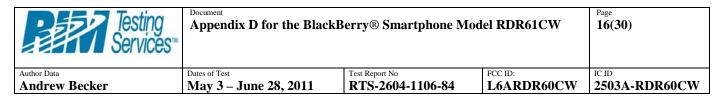
The following parameters and calculations were applied.

	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		

Certificate No: D835V2-446_Jan11



Appendix

Antenna Parameters with Head TSL

	Impedance, transformed to feed point	49.6 Ω - 7.7 jΩ
Γ	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.

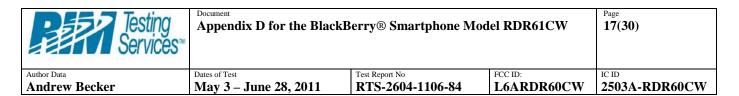
The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

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

Certificate No: D835V2-446_Jan11



DASY5 Validation Report for Head TSL

Date/Time: 21.01.2011 10:18:05

Test Laboratory: SPEAG, Zurich, Switzerland

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

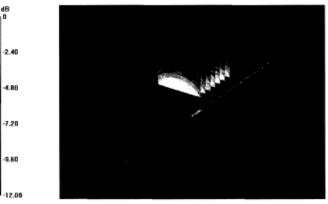
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL900 Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ϵ_r = 41.2; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

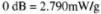
DASY5 Configuration:

- 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



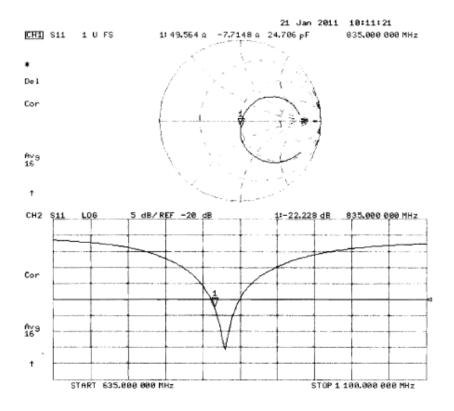


Certificate No: D835V2-446_Jan11

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Testing Services™	Appendix D for the Black	Berry® Smartphone Moo	del RDR61CW	Page 18(30)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan11

Page 6 of 6

v Becker M	es of Test ay 3 – June 28, 2011	Test Report No RTS-2604-1106-84	FCC ID: L6ARDR60CW	IC ID 2503A-RDR60
Calibration Laborate Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zu		IDC-MRA C.	S Schweizerischer Kalibr Service suisse d'étalon Servizio svizzero di tar S Swiss Calibration Servi	atura
Accredited by the Swiss Accred The Swiss Accreditation Serv Multilateral Agreement for the	vice is one of the signatorie	s to the EA certificates	lion No.: SCS 108	
	sting Services)	Denne a side official acceleration	No: D1900V2-545_Ja	in11
CALIBRATION	CERTIFICATE			1.4.1.2.4.1.5 1.4.4.85 1.4.4.85
Object	D1900V2 - SN: 5	45 COMPANY & CANOR PRES		
Calibration procedure(s)		dure for dipole validation kits		n an
	이 가지 않는 것이 있는 것이 있다. 			Suger 2
Calibration date:	January 13, 2011			
This calibration certificate doc The measurements and the ur	January 13, 2011 uments the traceability to nation neertainties with confidence pro- ducted in the closed laborator		s and are part of the certificate	
This calibration certificate doct The measurements and the un All calibrations have been con Calibration Equipment used (N	January 13, 2011 uments the traceability to nation ducted in the closed laborator M&TE critical for calibration)	onal standards, which realize the physical robability are given on the following pages y facility: environment temperature (22 ±	s and are part of the certificate 3)°C and humidity < 70%.	-
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This calibration certificate doc The measurements and the ur All calibrations have been con Calibration Equipment used (M Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	January 13, 2011 uments the traceability to nation ducted in the closed laborator M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g)	onal standards, which realize the physical robability are given on the following pages y facility: environment temperature (22 ± <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158)	s and are part of the certificate 3)°C and humidity < 70%. Scheduled Calibrati Oct-11 Oct-11 Mar-11	-
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This calibration certificate doct The measurements and the ur All calibrations have been con 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	January 13, 2011 uments the traceability to nation neertainties with confidence pro- ducted in the closed laborator M&TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID #	onal standards, which realize the physical robability are given on the following pages y facility: environment temperature (22 ± <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) Check Date (in house)	s and are part of the certificate 3)°C and humidity < 70%. Scheduled Calibrati Oct-11 Oct-11 Mar-11 Mar-11 Apr-11	-
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This calibration certificate doct The measurements and the ur All calibrations have been con 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	January 13, 2011 uments the traceability to nation neertainties with confidence pro- ducted in the closed laborator A&TE critical for calibration) ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	onal standards, which realize the physical robability are given on the following pages y facility: environment temperature (22 ± <u>Cal Date (Certificate No.)</u> 06-Oct-10 (No. 217-01266) 06-Oct-10 (No. 217-01266) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01158) 30-Mar-10 (No. 217-01162) 30-Apr-10 (No. ES3-3205_Apr10) 10-Jun-10 (No. DAE4-601_Jun10) <u>Check Date (in house)</u> 18-Oct-02 (in house check Oct-09) 4-Aug-99 (in house check Oct-09) 18-Oct-01 (in house check Oct-10) Eunction	s and are part of the certificate 3)°C and humidity < 70%. Scheduled Calibrati Oct-11 Oct-11 Mar-11 Mar-11 Jun-11 Scheduled Check In house check: Oc In house check: Oc	ion 4-11 4-11
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Certificate No: D1900V2-545_Jan11

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Appendix D for the BlackBerry® Smartphone Model RDR61CW

Test Report No

Andrew Becker

Dates of Test May 3 – June 28, 2011

RTS-2604-1106-84

FCC ID: L6ARDR60CW

60CW 2503A-RDR60CW

Calibration Laboratory of

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





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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) 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:

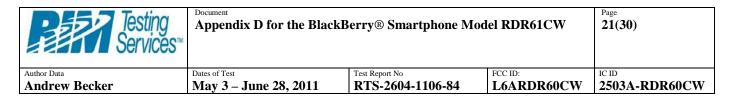
d) DASY4/5 System Handbook

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

Page 2 of 6



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.

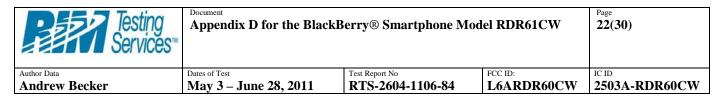
	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.5 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C		

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	
	condition 250 mW input power	5.26 mW / g
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured SAR normalized		5.26 mW / g 21.0 mW / g

Certificate No: D1900V2-545_Jan11

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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
and the factor of the second	

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.

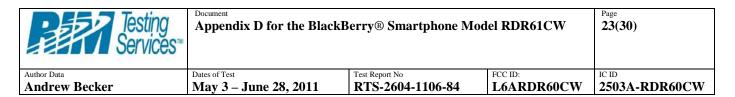
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 15, 2001

Certificate No: D1900V2-545_Jan11

Page 4 of 6



DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 14:52:49

Test Laboratory: SPEAG, Zurich, Switzerland

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

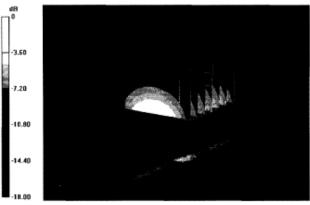
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U12 BB Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 38.6; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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



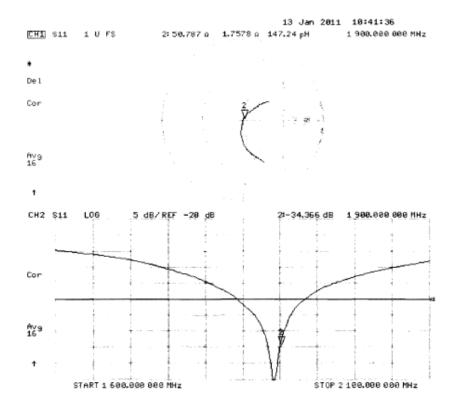


Certificate No: D1900V2-545_Jan11

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Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RDR61CW			Page 24(30)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Andrew Becker	May 3 – June 28, 2011	RTS-2604-1106-84	L6ARDR60CW	2503A-RDR60CW

Impedance Measurement Plot for Head TSL



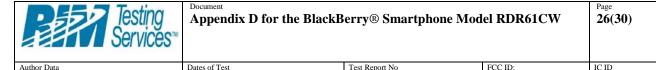
Certificate No: D1900V2-545_Jan11

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			1	
Becker	Dates of Test May 3 – June 28, 201	Test Report No 1 RTS-2604-1106-84	FCC ID: L6ARDR60CW	IC ID 2503A-RDR6
Calibration Labor Schmid & Partner Engineering AG Zeughausstrasse 43, 8004	-	BC MRA SWISS S R C Z Z R HORATO S	Schweizerischer Kalibri Service suisse d'étalonr Servizio svizzero di tara Swiss Calibration Servio	nage itura
	reditation Service (SAS) ervice is one of the signatorie the recognition of calibration	s to the EA	No.: SCS 108	
Client RTS (RIM	Festing Services)	Certificate No	a: D2450V2-747_No	v09
CALIBRATIO	N CERTIFICATE	22 2 M. M. M. M. M. M. S. S.		
Object	D2450V2 - SN: 7	47 ////////////////////////////////////	er star letter	88
Calibration procedure(s)	QA CAL-05,v7 Calibration proce	dure for dipole validation kits		
Calibration date:	November 11, 20	00		9960 1
		0 09 % in 1757, 2457, 2557, 2567, 2577, 25		
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Andrew Becker

May 3 – June 28, 2011

RTS-2604-1106-84

FCC ID: L6ARDR60CW

DR60CW 2503A-RDR60CW

Calibration Laboratory of

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





S Schweizerischer Kalibrierdienst

C Service suisse d'étalonnage Servizio svizzero di taratura

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) 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

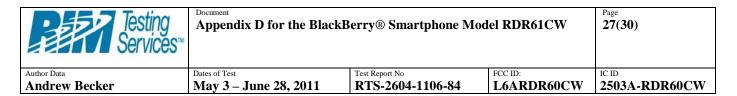
Additional Documentation:

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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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			
SAR averaged over 10 cm (10 g) of read 15L			
	condition		
	250 mW input power	6.23 mW / g	
SAR measured SAR normalized		6.23 mW / g 24.9 mW / g	

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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

Electr	rical Delay (one direction)	1.161 ns

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

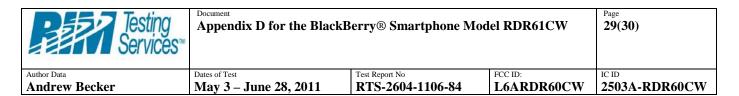
The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. No excessive force must be applied to the dipole arms, because they might bend or the soldered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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 01, 2003

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DASY5 Validation Report for Head TSL

Date/Time: 11.11.2009 15:04:10

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)

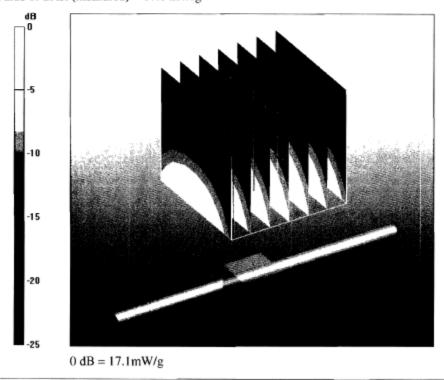
DASY5 Configuration:

- 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

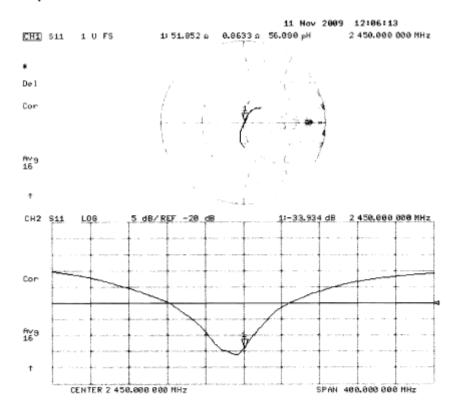


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