RTS RIM Testing Services	Document Appendix for the BlackBerr SAR Report	y® Smartphone Model	RBY41GW	Page 1(19)
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY4)GW

APPENDIX D2: DIPOLE CALIBRATION DATA

esting Services	SAR Report			2(
sting services	Dates of Test	Test Report No	FCC ID:	
r Ninad	June 02-24, 200	08 RTS-1114-080	6-05 L6A RBY	40GV
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Calibration Laborate	ory of	Swiss s	chweizerischer Kalibrierdienst	
Schmid & Partner			iarvice suisse d'étalonnage	
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Anagonossoresse 43, boo4 20	non, owngenand	CON CARPY of I	wiss Calibration Service	
Accredited by the Swiss Federa	al Office of Metrology and Ac	creditation Accreditation N	.: SCS 108	
The Swiss Accreditation Service	vice is one of the signatorie	es to the EA		
Multilateral Agreement for th	e recognition of calibration		0835V2-446 Jan07	10075
And Distances			303542-440_38107	
CALIBRATION	CERTIFICATE			
Object	D835V2 - SN: 44	16		
Object	D035V2 - SN: 44	10	And a state of the state	
P. P	01.041.05			
Calibration procedure(s)	QA CAL-05.v6	uture for directo unlidetion bits		
	Calibration proce	dure for dipole validation kits		
Calibration date	January 8, 2007			
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of Test	Test Report No	FCC ID:	
e 02-24, 2008	RTS-1114-0806-05	L6A RBY40	GW
c	K Report of Test e 02-24, 2008	of Test Report No	of Test Test Report No FCC ID:

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



- Schweizerischer Kalibrierdianst Service suisse d'étalonnage С
 - Servizio svizzero di taratura

S Swiss Calibration Service

Accreditation No.: SCS 108

S

Accredited by the Swiss Federal Office of Metrology and Accreditation The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossan

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) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- 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 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: D835V2-445 Jan07

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RTS RIM Testing Services	Appendix for the Black SAR Report	Berry® Smartphone Mode	l RBY41GW	Page 4(19)
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY4)GW

Measurement Conditions

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

DASY Version	DASY4	V4.7
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	

1.1

Head TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) *C	40.2±6%	0.88 mho/m ± 6 %
Head TSL temperature during test	(22.2 ± 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	2.33 mW / g
SAR normalized	normalized to 1W	9.32 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	9.28 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	253 mW input power	1.52 mW / g
SAR normalized	normalized to 1W	6.08 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	6.04 mW/g±16.5 % (k=2)

1 Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

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Certificate No: D835V2-446_Jan07

RTS RIM Testing Services	Document Appendix for the BlackBerr SAR Report	y® Smartphone Model	RBY41GW	Page 5(19)
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY4)GW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω - 5.8 jΩ
Return Loss	- 24.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 ns	
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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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DASY4 Validation Report for Head TSL

Date/Time: 08.01.2007 11:34:46

Test Laboratory: SPEAG, Zurich, Switzerland

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

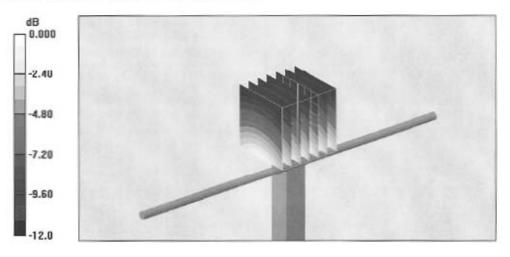
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1 Medium: HSL 900 MHz; Medium parameters used: f = 835 MHz; σ = 0.88 mho/m; ϵ_r = 40.3; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- · Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = 0.017 dB Peak SAR (extrapolated) = 3.43 W/kg SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/g Maximum value of SAR (measured) = 2.51 mW/g



0 dB = 2.51mW/g

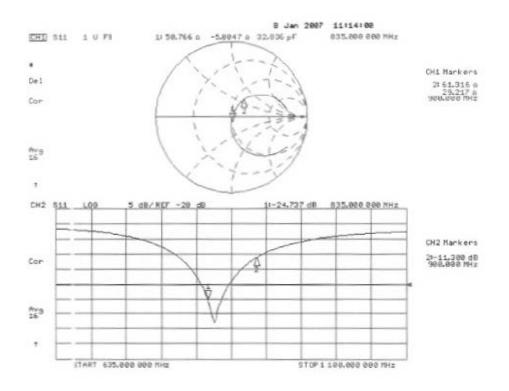
Certificate No: D835V2-445_Jan07

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RTS RIM Testing Services	Document Appendix for the BlackBer SAR Report	rry® Smartphone Model	RBY41GW	Page 7(19)
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY4)GW

Impedance Measurement Plot for Head TSL

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Certificate No: D835V2-446_Jan07

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Ninad	Dates of Test June 02-24, 200	8 Test Report No 8 RTS-1114-080	FCC ID: 16-05 L6A RBY4	40GV	
Calibration Labor	atom of				
Schmid & Partner Engineering AG Zeughausstrasse 43, 8004			Schweizerischer Kalibrierdienst Service suitse d'étaionnage Servizio svizzero di taratura Swiss Calibration Service		
The Swiss Accreditation	deral Office of Metrology and Ac Service is one of the signatoric r the recognition of calibration	s to the EA	a.: SCS 108		
Client RIM		Certificate No: [D1900V2-545_Jan07		
CALIBRATIO	N CERTIFICATE				
Object	D1900V2 - SN: 5	45			
Calibration procedure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits			
Calibration date:	January 9, 2007	CONTRACTOR	Station of the		
Condition of the calibrated	tem In Tolerance	In Tolerance			
	documents the tracestelly to eat	ional standards, which realize the physical units			
The measurements and th All calibrations have been	e uncertainties with confidence p conducted in the closed laborato d (M&TE ortical for calibration) ID # G837480704 US37292783	Cal Date (Calibrated by, Certificate No.) 03-Oct-06 (METAS, No. 217-00808) 03-Oct-06 (METAS, No. 217-00808) 10-Act-06 (METAS, No. 217-00808)	nd humidity < 70%. Scheduled Calibration Oct-07 Oct-07		
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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



Schweizerischer Kalibrierdienst s

Service suisse d'étalonnage

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Accreditation No.: SCS 108

Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation 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) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- 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 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_Jan07

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan Resolution	dx, dy = 15 mm	
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	38.8 ± 6 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	9.49 mW / g
SAR normalized	normalized to 1W	38.0 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	37.0 mW/g±17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.98 mW / g
SAR normalized	normalized to 1W	19.9 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	19.6 mW / g ± 16.5 % (k=2)

Certificate No: D1900V2-545_Jan07

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 0.2 jΩ		
Return Loss	- 34.1 dB		

General Antenna Parameters and Design

	Electrical Delay (one direction)	1.197 ns
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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		

. . ..

DASY4 Validation Report for Head TSL

Date/Time: 09.01.2007 12:59:52

Test Laboratory: SPEAG, Zurich, Switzerland

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

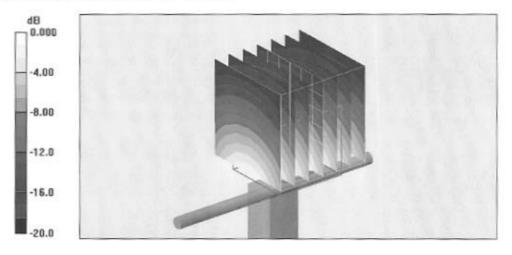
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB; Medium parameters used: f = 1900 MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- · Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 90.8 V/m; Power Drift = 0.018 dB Peak SAR (extrapolated) = 16.5 W/kg SAR(1 g) = 9.49 mW/g; SAR(10 g) = 4.98 mW/g

Maximum value of SAR (measured) = 10.7 mW/g

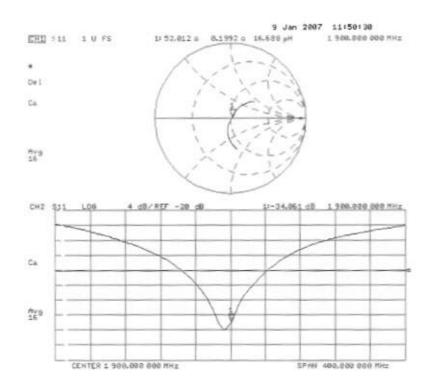


0 dB = 10.7mW/g

Certificate No: D1900V2-545_Jan07

RTS RIM Testing Services	Document Appendix for the BlackBerr SAR Report	y® Smartphone Model	RBY41GW	Page 13(19)
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY40)GW

Impedance Measurement Plot for Head TSL

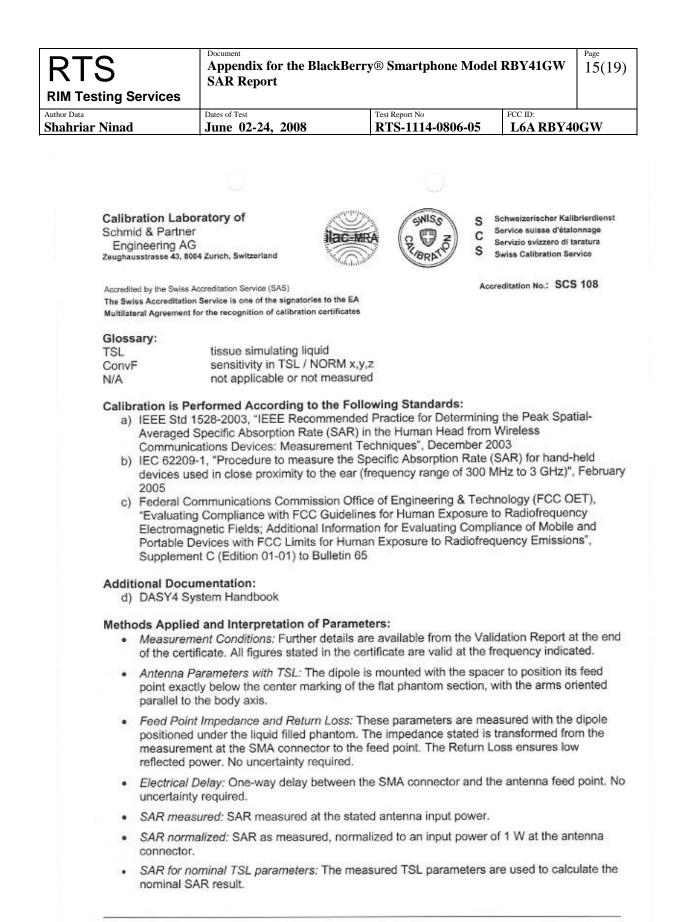


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or Data ahriar N	Vinad	Dates of Test June 02-24, 2008	Test Rep		FCC ID:	
Ø			8 K15	-1114-0806-05	L6A RBY4	0GW
	AM					
5	Calibration Labora Schmid & Partner Engineering AG Joughausstrasse 43, 8004 Z			Z C Service s Servizio s	erischer Kalibrierdienst sulsse d'étalonnage svizzero di taratura libration Service	
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	Client RIM			Certificate No: D2450	V2-747_Nov07	
D	CALIBRATION	I CERTIFICATE				
1	Object	D2450V2 - SN: 7			an ad an an an a	
	Collingting amond up/e)	QA CAL-05.v6				
	Calibration procedure(s)		edure for dipole validati	ion kits		
	Calibration date:	November 06, 20	007		and starts	
	Condition of the calibrated ite	In Tolerance				
	The measurements and the u	uncertainties with confidence pr nducted in the closed laborator	ional standards, which realize th probability are given on the folio ry facility: environment tempera	wing pages and are part of	f the certificate.	
	Primary Standards	ID #	Cal Date (Calibrated by, Ce	rtificate No.) Schr	eduled Calibration	
	Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217			
	Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217	50.750.760. Silke		
	Reference 20 dB Attenuator	SN: 5086 (20g) SN: 5047 2 (10-)	07-Aug-07 (METAS, No 217 07-Aug-07 (METAS, No 217			
	Reference 10 dB Attenuator Reference Probe ES3DV2	SN: 5047.2 (10r) SN: 3025	07-Aug-07 (METAS, No 217 26-Oct-07 (SPEAG, No. ES			
1	DAE4	SN: 601	30-Jan-07 (SPEAG, No. DA			
	Secondary Standards	ID #	Check Date (in house)	Sche	eduled Check	
	Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in hous		ouse check: Oct-08	
	RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house		ouse check: Oct-09	
	Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in hous	e check Oct-07) In ho	ouse check: Oct-08	
	Calibrated hus	Name Obvidie Laubler	Function	Contraction of the second s	hature	10000
	Calibrated by:	Claudio Leubler	Laboratory Tech	inician	15h	
	Approved by:	Katja Pokovic	Technical Mana	iger	L. K.L	
	This calibration certificate sha	all not be reproduced except in	full without written approval of		d: November 15, 2007	125/25
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Certificate No: D2450V2-747_Nov07

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Measurement Conditions

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

DASY Version	DASY4	V4.7
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	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	38.4±6%	1.85 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 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	13.6 mW / g
SAR normalized	normalized to 1W	54.4 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	53.2 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.27 mW / g
SAR normalized	normalized to 1W	25.1 mW/g
SAR for nominal Head TSL parameters 1	normalized to 1W	24.8 mW / g ± 16.5 % (k=2)

1 Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Certificate No: D2450V2-747_Nov07

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RTS RIM Testing Services	Document Appendix for the BlackBerry® Smartphone Model RBY41GW SAR Report			
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY40)GW

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.2 Ω + 2.1 jΩ	
Return Loss	– 32.4 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 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

DASY4 Validation Report for Head TSL

Date/Time: 06.11.2007 15:01:41

Test Laboratory: SPEAG, Zurich, Switzerland

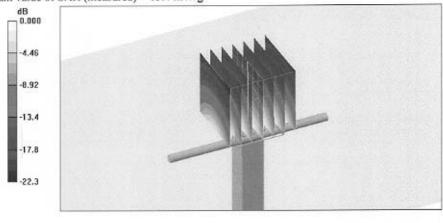
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN747

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB; Medium parameters used: f = 2450 MHz; σ = 1.79 mho/m; ϵ_r = 38; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 SN3025 (HF); ConvF(4.41, 4.41, 4.41); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 93.4 V/m; Power Drift = 0.016 dB Peak SAR (extrapolated) = 29.4 W/kg SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.27 mW/g Maximum value of SAR (measured) = 15.4 mW/g



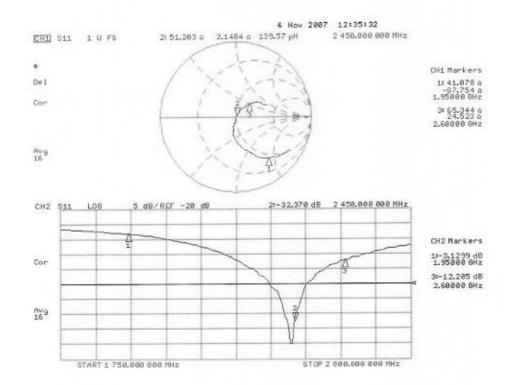
0 dB = 15.4 mW/g

Certificate No: D2450V2-747_Nov07

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RTS RIM Testing Services	Appendix for the BlackBerry® Smartphone Model RBY41GW SAR Report			
Author Data	Dates of Test	Test Report No	FCC ID:	
Shahriar Ninad	June 02-24, 2008	RTS-1114-0806-05	L6A RBY40)GW

Impedance Measurement Plot for Head TSL



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