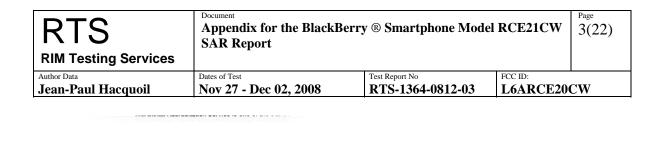
RTS RIM Testing Services	Document Appendix for the BlackBer SAR Report	rry ® Smartphone Mode	RCE21CW	Page 1(22)
Author Data	Dates of Test	Test Report No	FCC ID:	
Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20CW	

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

RTS	Appendix for the BlackBerry ® Smartphone Model RCE21CW SAR Report			Page 2(22)	
RIM Testing Services	DatasefTect				
uthor Data ean-Paul Hacquoil	Dates of Test Nov 27 - Dec 02, 2	.008 Test Report No RTS-1364	-0812-03	FCC ID: L6ARCE20	CW
Calibration La Schmid & Part Engineering	tner AG	ANISS S	Service suisse d'éta Servizio svizzero di	lionnage taratura	
	i, 8004 Zurich, Switzerland	Accreditation	Swiss Calibration S	ervice	
The Swiss Accredit	ation Service is one of the signatorie ent for the recognition of calibration	s to the EA			
Client RIM			o: ET3-1642_Jan	08	
CALIBRA	TION CERTIFICAT	E			
Object	ET3DV6 - SN:16	42			
Calibration procedur		dure for dosimetric E-field probe	5		
Calibration date:	January 18, 200			网络南部	
Condition of the cali	brotod itom In Tolorance				
		onal standards, which realize the physical un robability are given on the following pages ar			
All calibrations have	been conducted in the closed laborato	ry facility: environment temperature (22 \pm 3)%	C and humidity < 70%.		
Calibration Equipme	ent used (M&TE critical for calibration)				
Primary Standards Power meter E4419 Power sensor E441		Cal Date (Calibrated by, Certificate No.) 29-Mar-07 (METAS, Nc. 217-00670) 29-Mar-07 (METAS, Nc. 217-00670)	Scheduled Calit Mar-08 Mar-08	oration	
Power sensor E441 Reference 3 dB Atte Reference 20 dB Atte	2A MY41498087 mustor SN: 55054 (3c)	29-Mar-07 (METAS, Nc. 217-00670) 8-Aug-07 (METAS, No. 217-00719) 29-Mar-07 (METAS, Nc. 217-00671)	Mar-08 Aug-08 Mar-08		
Reference 30 dB Att	tenuator SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08		
Reference Probe ES DAE4	S3D/2 SN: 3013 SN: 654	2-Jan-08 (SPEAG, No. ES3-3013_Jan08) 20-Apr-07 (SPEAG, No. DAE4-654_Apr07			
Secondary Standard RF generator HP 66 Network Analyzer H	48C US3642U01700	Check Date (in house) 4-Aug-99 (SPEAG, in house check Oct-07 18-Oct-01 (SPEAG, in touse check Oct-0		Oct-09	
notion Anogen A					
Calibrated by:	Namo Katja Pokovic	Function Technical Manager	Signature	11.0	
		and a second	1 A	K	
Approved by:	Niels Kuster	Quality Manager	1.14	de la	
			Issued: January	18 2008	



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



S Schweizorischer Kalibrierdienst Service suisse d'étaionnage Servizio svizzero di taratura S Swiss Calibration Service

Accreditation No.: SCS 108

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

Glossary:

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 nside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * irequency_response (see Frequency Resonse 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 (no uncertainty required). DCP does not depend on frequency nor media.
- 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 Oifset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance recuired.

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Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20	CW

January 18, 2008

Probe ET3DV6

SN:1642

Manufactured: Last calibrated: Recalibrated: November 7, 2001 January 15, 2007 January 18, 2008

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

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January 18, 2008

DASY - Parameters of Probe: ET3DV6 SN:1642

Sensitivity in Free	Diode Compression ^B			
NormX	1.67 ± 10.1%	μV/(V/m) ²	DCP X	91 mV
NormY	1.86 ± 10.1%	μV/(V/m) ²	DCP Y	91 mV
NormZ	1.64 ± 10.1%	μV/(V/m) ²	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Cente	er to Phantom Surface Distance	3.7 mm	4.7 mm
SAR _{bi} [%]	Without Correction Algorithm	11.3	6.7
SAR _{be} [%]	With Correction Algorithm	0.8	0.4

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Cente	r to Phantom Surface Distance	3.7 mm	4.7 mm
SAR [%]	Without Correction Algorithm	14.0	8.3
SAR _{bs} [%]	With Correction Algorithm	0.9	0.7

Sensor Offset

```
Probe Tip to Sensor Center
```

2.7 mm

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 NermX,Y,Z do not affect the E²-field uncertainty inside TSL(see Page 8).
^b Numerical Inserization parameter: uncertainty not required.

Certificate No: ET3-1642_Jan08

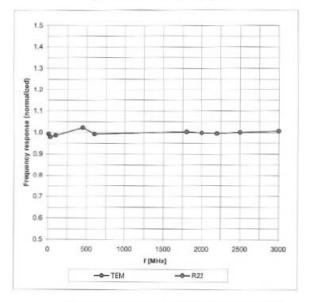
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Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20CW	

January 18, 2008

Frequency Response of E-Field

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



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

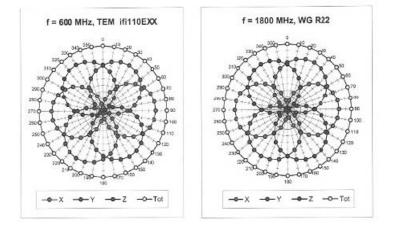
Certificate No: ET3-1642_Jan08

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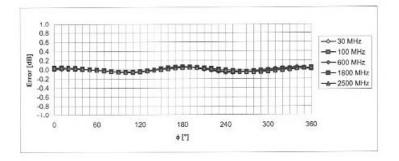
RTS RIM Testing Services	Document Appendix for the BlackBer SAR Report	rry ® Smartphone Mode	RCE21CW	Page 7(22)
Author Data	Dates of Test	Test Report No	FCC ID:	
Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20CW	

January 18, 2008

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



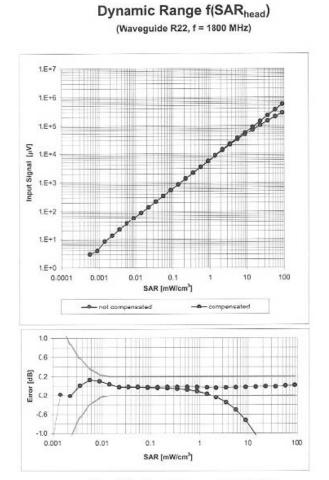
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ET3-1642_Jan08

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Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20CW	

January 18, 2008



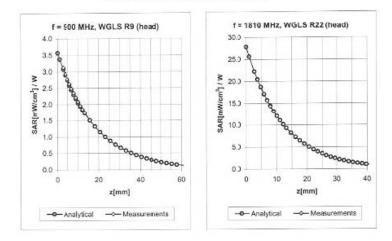
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ET3-1642_Jan08

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January 18, 2008



Conversion Factor Assessment

f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.82	1.74	6.42 ± 11.0% (k=2)
1810	+ 50 / + 100	Head	40.0 ± 5%	1.40 ± 5%	0.52	2.85	5.15 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.C ± 5%	1.40 ± 5%	0.57	2.49	4.98 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.76	1.92	4.52 ± 11.8% (k=2)
000	. 50 / . 400	Dedu	55.C ± 5%	1.05 ± 5%	0.85	1.73	6.13 ± 11.0% (k=2)
900	± 50 / ± 100	Body	10000 m 0 14				
1810	1 50 / 1 100	Body	53.3±5%	1.52 ± 5%	0.65	2.70	4.85 ± 11.0% (k=2)
1950	±50/±100	Body	$53.2\pm5\%$	$1.52\pm5\%$	0.61	2.32	4.56 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.81	1.88	4.08 ± 11.8% (k=2)

^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.

Certificate No: ET3-1642_Jan08

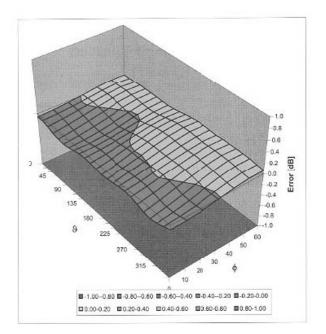
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January 18, 2008



Error (¢, ୬), f = 900 MHz



Uncertainty of Epherical Isotropy Assessment: ± 2.6% (k-2)

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	Dates of Test Nov 27 - Dec 02, 20	Test Report No RTS-1364-0812-03	FCC ID: L6ARCE20CW
Calibration Labora Schmid & Partner Engineering AG		ilac-MRA (C C z) C	Schweizerischer Kalibrierdier Service suisse d'étalonnago Servizio svizzero di taratura
The Swiss Accreditation S Multilateral Agreement for Client RIM	eral Office of Metrology and Ac ervice is one of the signatorie the recognition of calibration	reditation Accreditation N s to the EA certificates Certificate No: 1	swiss Calibration Service o.: SCS 108 D835V2-446_Jan07
	N CERTIFICATE		
Object	D835V2 - SN: 44	6	
Calibration procedure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits	
Calibration date:	January 8, 2007	Charles and the second	IN THE STATE
Condition of the calibrated it	In Tolerance		and and the second of
		ond standards, which realize the physical units o robability are given on the following pages and a	
All calibrations have been or	enducted in the closed laborato	y facility: environment temperature (22 ± 3)*C ar	nd humidity < 70%.
Calibration Equipment used	(M&TE critical for calibration)		
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 (h DAE4	SN: 5047.2 (10r)	Cal Date (Calibrated by, Certificate No.) 03-Oct-06 (METAS, No. 217-00608) 03-Oct-06 (METAS, No. 217-00608) 10-Aug-06 (METAS, No 217-00591) 10-Aug-06 (METAS, No 217-00591) 19-Oct-06 (SPEAG, No. ET3-1507_Oct06) 20-Jul-06 (SPEAG, No. DAE4-907_Jul06)	Scheduled Calibration Oct-07 Aug-07 Aug-07 Oct-07 Jul-07
Country Down	line		
Secondary Standards Power sensor HP 8481A	ID# MY41092317	Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-05)	Scheduled Check In house check: Oct-07
RF generator Agient E44211 Network Analyzer HP 8753E	B MY41000675	11-May-05 (SPEAG, in house check Nov-05) 18-Oct-01 (SPEAG, in house check Oct-06)	
000000000000000000000000000000000000000	Name	Function	Signature
Calibrated by:	Marpal Fehr	Laboratory Technician	Malle
Approved by:	Katja Pokovic	Technical Manager	Hine Vity
This calibration certificate sh	all not be reproduced except in	full without written approval of the laboratory.	Issued: January 9, 2007

Certificate No: D835V2-446_Jan07

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RTS RIM Testing Services	Document Appendix for the BlackBerry ® Smartphone Model RCE21CW SAR Report		Page 12(22)	
Author Data	Dates of Test	Test Report No	FCC ID:	
Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20	CW

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

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Accreditation No.: SCS 108

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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Author Data	Dates of Test	Test Report No	FCC ID:	
Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20	CW

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	

.

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	g / Win 80.6
SAR for nominal Head TSL parameters 3	normalized to 1W	6.04 mW/g±16.5 % (k=2)

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

Certificate No: D835V2-446_Jan07

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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	
----------------------------------	----------	--

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

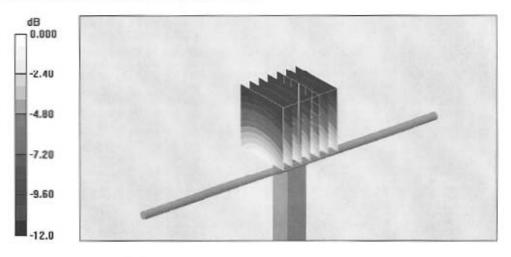
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1 Medium: HSL 900 MHz; Medium parameters used: f = 835 MHz; σ = 0.88 mho/m; ϵ_r = 40.3; ρ = 1000 kg/m³ Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

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

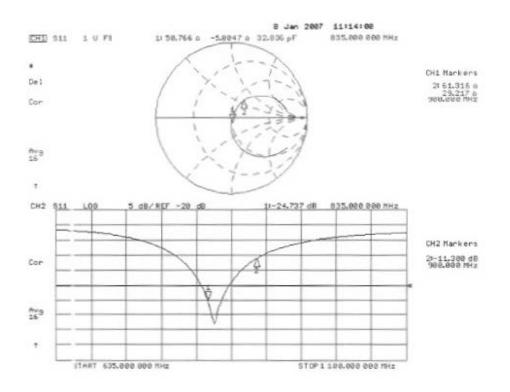
Certificate No: D835V2-445_Jan07

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Impedance Measurement Plot for Head TSL

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ıl Hacquo		es of Test ov 27 - Dec 02, 2008	Test Report No RTS-1364-0812-03	FCC ID: L6ARCE20CW
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Accredit The Swi	ed by the Swits Fed las Accreditation S	Zurich, Switzerland Seral Office of Metrology and Ac ervice is one of the signatoris the recognition of calibration	creditation Accreditation N to to the EA	Swiss Calibration Service
Client	RIM		Certificate No:	D1900V2-545_Jan07
CAL	IBRATIO	N CERTIFICATE	Service States	and the second second
Object		D1900V2 - SN: 5	645	10 10 10 20
Calibrat	tion procedure(s)	QA CAL-05.v6 Calibration proce	odure for dipole validation kits	
Calibrat	ion date:	January 9, 2007		
General		ACCOUNT OF A DATA AND A DATA AND A DATA AND A DATA		and the second sec
1.1.1.25.00	on of the calibrated i			
Condition This call The main All calls	Ibration certificate d advicements and the pretions have been o	tem In Tolerance tocuments the traceability to nat s uncertainties with confidence p	fonal standards, which realize the physical units probability are given on the following pages and ry facility: environment temperature (22 ± 3)*C a	are part of the certificate.
Condition This call The mile All callbrat	Ibration certificate d advicements and the pretions have been o	item In Tolerance locuments the traceability to nat a uncertainties with confidence p conducted in the closed laborato	probability are given on the following pages and	are part of the certificate.
Condition This call The me All callbrat Originary Power in	Ibration certificate d assurements and the prations have been o ton Equipment used of Standards metor EPM-442A	tem In Tolerance	crobability are given on the following pages and ry facility: environment temperature (22 ± 3)*C = Cal Date (Calibrated by, Certificate No.) 03-Oct-06 (METAS, No. 217-00608)	are part of the certificate, and humidity < 70%, Scheduled Calibration Oct-07
Condition This call The me All callbrat Callbrat Primary Power n Power s	Ibration certificate d assurements and the prations have been o ton Equipment used of Standards meter EPM-442A sensor HP 6481A	tem In Tolerance	crobability are given on the following pages and ry facility: environment temperature (22 ± 3)*C = <u>Cal Date (Calibrated by, Certificate No.)</u> 03-Oct-06 (METAS, No. 217-00608) 03-Oct-06 (METAS, No. 217-00605)	are part of the certificate, and humidity < 70%, Scheduled Calibration Oct-07 Oct-07
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Condition This call The me All callbrat Callbrat Primary Power in Power in Referen Referen	Ibration certificate d assurements and the prations have been o ton Equipment used of Standards meter EP-M-442A sensor H-P 8481A ros 20 dE Attenuato	tem In Tolerance tocuments the traceability to nation a uncertainties with confidence p conducted in the closed laborato d (M&TE ortical for calibration) ID # G837460704 US37292783 r SN: 5065 (20g)	crobability are given on the following pages and ry facility: environment temperature (22 ± 3)*C = Cal Date (Calibrated by, Certificate No.) 03-Oct-06 (METAS, No. 217-00608) 03-Oct-06 (METAS, No. 217-00608) 10-Aug-06 (METAS, No. 217-00591)	are part of the certificate. and humidity < 70%. Scheduled Calibration Oct-07 Oct-07 Aug-07
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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



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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)

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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	

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DASY4 Validation Report for Head TSL

Date/Time: 09.01.2007 12:59:52

Test Laboratory: SPEAG, Zurich, Switzerland

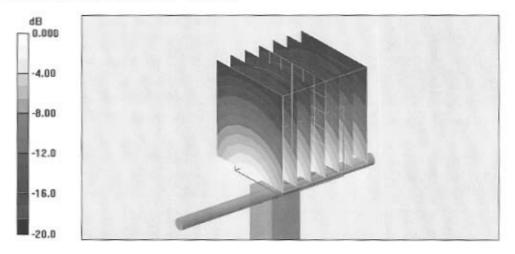
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

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

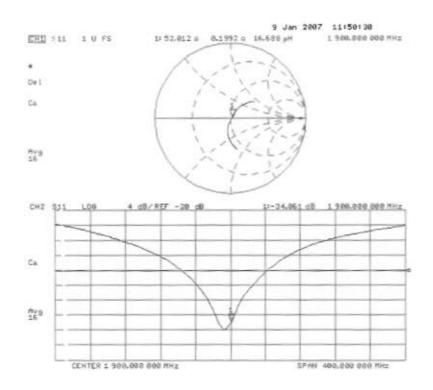


0 dB = 10.7mW/g

Certificate No: D1900V2-545_Jan07

RTS RIM Testing Services	Document Appendix for the BlackBer SAR Report	ry ® Smartphone Mode	I RCE21CW	Page 22(22)
Author Data	Dates of Test	Test Report No	FCC ID:	
Jean-Paul Hacquoil	Nov 27 - Dec 02, 2008	RTS-1364-0812-03	L6ARCE20	CW

Impedance Measurement Plot for Head TSL



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