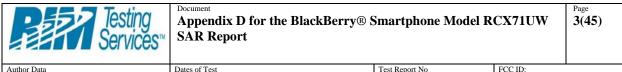
Testing Services™	Appendix D for the BlackBerry® Smartphone Model RCX71UW SAR Report				
Author Data	Dates of Test	Test Report No	FCC ID:		
Andrew Becker	February 09 – March 03, 2010 RTS-2474-1002-41 L6ARCX70				

# APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

	Date	es of Test		Test Report No	FCC ID:	
ew Beckei	· Fe	bruary 09 – March	n 03, 2010	RTS-2474-100	2-41 L6ARC	X70UW
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	and the second sec	or the recognition of calibratio Testing Services)	n certificates	Certificate No: 8	ET3-1643_Mar09	<b>Male Hoo</b> l
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	CALIBRATIC	ON CERTIFICAT	E			
	Object	ET3DV6 - SN:1	643			8
	Calibration procedure(s)		and QA CAL-23.v.			
	Celibration data:	March 10, 2005	1		THE REAL PROPERTY AND	8
	Condition of the calibrate	ditem In Tolerance	1	1 Standard	Salar and	
	The measurements and t	documents the traceability to no he uncertainties with confidence conducted in the closed laborat	probability are given on	he following pages and ar	e part of the certificale.	
		ed (M&TE critical for calibration)				
	Calibration Equipment us			No 1	Scheduled Calibration	n
	Calibration Equipment us Primary Standards	ID #	Cal Date (Certificate	140.7		
	Primary Standards Power meter E4419B	GB41293874	1-Apr-08 (No. 217-0	0788)	Apr-09	
	Primary Standards Power meter E4419B Power sensor E4412A	GB41293874 MY41495277	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0	0788) 0788)	Apr-09	
	Primary Standards Power meter E44198 Power sensor E4412A Power sensor E4412A	GB41293874 MY41495277 MY41498087	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0	0788) 0788) 0788)	Apr-09 Apr-09	
	Primary Standards Power moter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuate	GB41293874 MY41495277 MY41498087 ar SN: \$5054 (3c)	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0	0788) 0788) 0788) 1865)	Apr-09 Apr-09 Jul-09	
	Primary Standards Power motor E41198 Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuat Reference 20 dB Attenua	GB41293871 MY41495277 MY41498087 ar SN: S5054 (3c) tor SN: S5056 (20b)	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0 31-Mar-08 (No. 217-0	0788) 0788) 0788) 1865) 00787)	Apr-09 Apr-09 Jul-09 Apr-09	
	Primary Standards Power moter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuate	GB41293871 MY41495277 MY41498087 or SN: S5054 (3c) tor SN: S5086 (20b) tor SN: S5129 (30b)	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0	0788) 0788) 0788) 0865) 00787) 1866)	Apr-09 Apr-09 Jul-09	
	Primary Standards Power meter E4/198 Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuat Reference 20 dB Attenua Reference 30 dB Attenua	GB41293871 MY41495277 MY41498087 or SN: S5054 (3c) tor SN: S5086 (20b) tor SN: S5129 (30b)	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0 31-Mar-08 (No. 217-0 1-Jul-08 (No. 217-0	0788) 0788) 0788) 0865) 00787) 1866) 1013_Jan09)	90-1qA 90-1qA 90-luL 90-1qA 90-luL	
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	Primary Standards Power meter E41198 Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuat Reference 30 dB Attenua Reference 30 dB Attenua Reference Probe ES3DV/ DAE4 Secondary Standards	GB41293874 MY41495277 MY4148087 M SN: S5054 (3c) tor SN: S5086 (20b) tor SN: S5129 (30b) 2 SN: 3013 SN: 3013 SN: 680 ID # US3842U01700	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0 31-Mar-08 (No. 217-0 31-Jul-08 (No. 217-0 2-Jan-08 (No. 217-0 2-Jan-09 (No. ES3- 9-Sep-06 (No. DAE-	0788) 0788) 0788) 0865) 00787) 1866) 1013_Jan09) -660_Sep00) e) check Oct-07)	Apr-09 Apr-09 Jul-09 Apr-09 Jul-09 Jan-10 Sep-09 Scheduled Check	
	Primary Standards Power motor E41198 Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuat Reference 3 dB Attenua Reference 30 dB Attenua Reference Probe ES3DV DAE4 Secondary Standards RF generator HP 8648C	GB41293874 MY41495277 MY41498087 or SN: S5054 (3c) tor SN: S5056 (20b) tor SN: S5056 (20b) 2 SN: 3013 SN: 600 ID # US3842U01700 US3842U01700 US37390585 Name	1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Apr-08 (No. 217-0 1-Jul-08 (No. 217-0 31-Mar-08 (No. 217-0 31-Jul-08 (No. 217-0 2-Jan-09 (No. 237- 9-Sep-06 (No. DAE- Check Date (in house 4-Aug-99 (in house	0788) 0788) 0788) 0865) 00787) 1866) 1013_Jan09) +-660_Sep00) e) check Oct-07) check Oct-08)	Apr-09 Apr-09 Jul-09 Apr-09 Jul-09 Jan-10 Sep-09 Scheduled Check In house check: Oct-0	
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Andrew Becker

# February 09 - March 03, 2010

L6ARCX70UW RTS-2474-1002-41

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



NIS

BRA

S

Schweizerischer Kallbrierdienst

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

s Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

# Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization $\phi$	o rotation around probe axis
Polarization 9	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ 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 ∂ = 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 E<sup>2</sup>-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 (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 Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

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Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW	

March 10, 2009

# Probe ET3DV6

# SN:1643

Manufactured: Last calibrated: Recalibrated: November 7, 2001 March 11, 2008 March 10, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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# DASY - Parameters of Probe: ET3DV6 SN:1643

Sensitivity in Free	Diode Compression <sup>B</sup>			
NormX	1.75 ± 10.1%	$\mu V/(V/m)^2$	DCP X	94 mV
NormY	1.98 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	95 mV
NormZ	1.79 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	93 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	r to Phantom Surface Distance	3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	11.4	7.7
SAR <sub>be</sub> [%]	With Correction Algorithm	0.9	0.6

#### TSL

1810 MHz Typical SAR gradient: 10 % per mm

Sensor Cente	r to Phantom Surface Distance	3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without Correction Algorithm	12.0	8.2
SAR <sub>be</sub> [%]	With Correction Algorithm	0.9	0.5

# 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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty nside TSL (see Page 8).

\* Numerical linearization parameter: uncertainty not required.

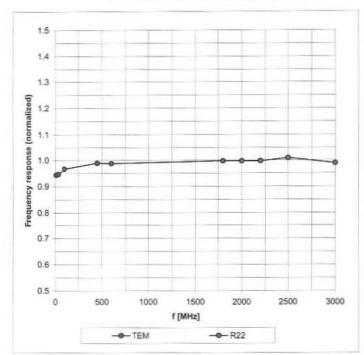
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March 10, 2009

# Frequency Response of E-Field



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

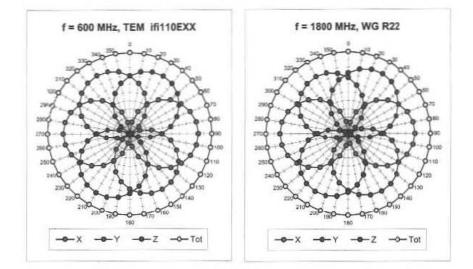
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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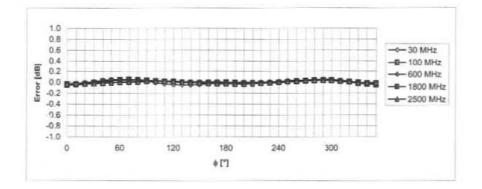
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# Receiving Pattern (\u00fc), 9 = 0°



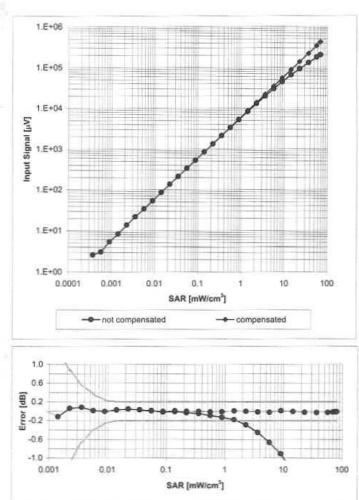
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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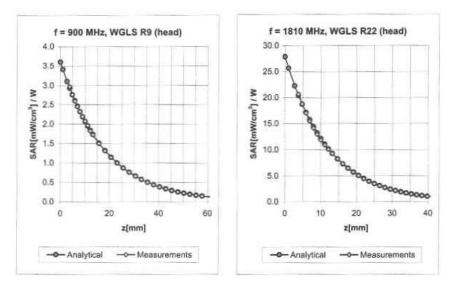
# Dynamic Range f(SAR<sub>head</sub>) (Waveguide R22, f = 1800 MHz)

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

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# **Conversion Factor Assessment**

f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.30	2.80	5.94 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.74	2.21	5.17 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.61	2.51	4.94 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.40	2.90	5.88 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.64	2.91	4.77 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3±5%	1.52 ± 5%	0.85	2.25	4.74 ± 11.0% (k=2)

<sup>C</sup> 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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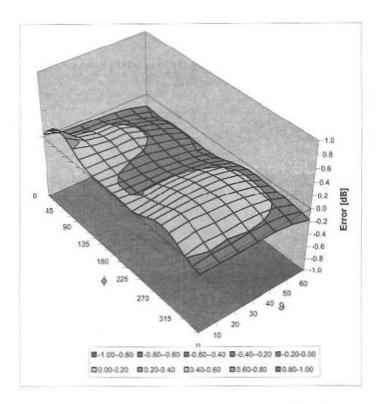
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# Deviation from Isotropy in HSL

Error (o, 3), f = 900 MHz



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

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Servicës		or the BlackBerry®	Smartphone Model	RCX71UW Page 11(4
<sup>ata</sup> ew Becker	Dates of Test February 09 –	March 03, 2010	Test Report No RTS-2474-1002-41	FCC ID: L6ARCX70UW
Calibration Laborato Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zuri		BC MRA	C Service suis	cher Kalibrierdienst se d'étalonnage zero di taratura ration Service
Accredited by the Swiss Accredit The Swiss Accreditation Servic Multilateral Agreement for the	e is one of the signatori recognition of calibration		Accreditation No.: SCS 1	
Client RTS (RIM Tes		- 6 <sup>1</sup>	Certificate No: ET3-1644	4_Nov09
CALIBRATION	CERTIFICAT	E della d	and the second	an basi meninaki
Object	ET3DV6 - SN:1	644	han an an an an an	and the second second
Calibration procedure(s)	QA CAL-01.v6, Calibration proc	QA CAL-23 v3 and Q/ edure for dosimetric E	-field probes	
		All Martin Contraction		* ************************************
Calibration date:	November 11, 2	009	an serie you that a property and the pro-	en stationer
Calibration date: This calibration certificate docur The measurements and the unc	nents the traceability to na	tional standards, which realize	the physical units of measurem	ents (SI).
This calibration certificate docur The measurements and the unc All calibrations have been conde	nents the traceability to na ertainties with confidence ucted in the closed laborate	tional standards, which realize probability are given on the fol	the physical units of measurem lowing pages and are part of the	ents (SI). : certificate.
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This calibration certificate docur The measurements and the unc All calibrations have been condu- Calibration Equipment used (M& Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	nents the traceability to na ertainties with confidence ucted in the closed laborat ATE critical for calibration) (D # GB41293874 MY41495277 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID # US3642U01700 US37390585 Name	tional standards, which realize probability are given on the fol ory facility: environment tempe Cal Date (Certificate No.) 1-Apr-09 (No. 217-01030) 1-Apr-09 (No. 217-01030) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 2-Jan-09 (No. 217-01	the physical units of measurem lowing pages and are part of the rature (22 ± 3)°C and humidity - Schedu Apr-10 Apr-10 Apr-10 8) Mar-10 8) Mar-10 7) Mar-10 Jan09) Jan-10 0_Sep09) Sep-10 	ents (SI). certificate. : 70%. led Calibration
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This calibration certificate docur The measurements and the unc All calibrations have been condu- Calibration Equipment used (M& Primary Standards Power meter E4419B Power sensor E4412A Power sensor E4412A Reference 3 dB Attenuator Reference 30 dB Attenuator Reference 30 dB Attenuator Reference Probe ES3DV2 DAE4 Secondary Standards RF generator HP 8648C Network Analyzer HP 8753E	nents the traceability to na ertainties with confidence ucted in the closed laborat ATE critical for calibration) (D # GB41293874 MY41495277 MY41498087 SN: S5054 (3c) SN: S5054 (3c) SN: S5056 (20b) SN: S5129 (30b) SN: S5129 (30b) SN: 3013 SN: 660 ID # US3642U01700 US37390585 Name	tional standards, which realize probability are given on the fol ory facility: environment tempe Cal Date (Certificate No.) 1-Apr-09 (No. 217-01030) 1-Apr-09 (No. 217-01030) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 2-Jan-09 (No. 217-0102) 31-Mar-09 (No. 217-0102) 31-Ma	the physical units of measurem lowing pages and are part of the rature (22 ± 3)°C and humidity of Apr-10 Apr-10 8) Mar-10 8) Mar-10 8) Mar-10 9) Mar-10 9) Schedu 0ct-09) Jan-10 9)_Sep09) Sep-10 Schedu 0ct-09) In house ( Oct-09) In house	ents (SI). certificate. : 70%. led Calibration



Appendix D for the BlackBerry® Smartphone Model RCX71UW

Author Data Andrew Becker

### Dates of Test February 09 - March 03, 2010

#### FCC ID: Test Report No L6ARCX70UW RTS-2474-1002-41

# Calibration Laboratory of

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



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

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

# Glossary:

<b>,</b>	
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 $\phi$	e rotation around probe axis
Polarization 8	9 rotation around an axis that is in the plane normal to probe axis (at measurement center).
	i.e., 9 = 0 is normal to probe axis

# Calibration is Performed According to the Following Standards:

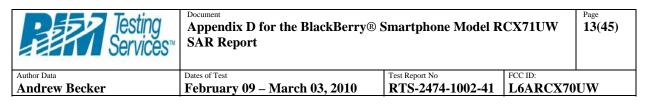
- a) IEEE Std 1528-2003, \*IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held 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 E<sup>2</sup>-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: ET3-1644 Nov09

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# Probe ET3DV6

# SN:1644

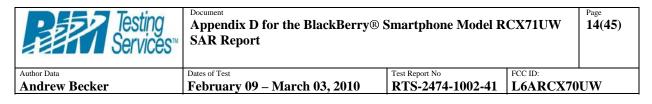
Manufactured: Last calibrated: Recalibrated: November 7, 2001 November 10, 2008 November 11, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1644\_Nov09

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November 11, 2009

# DASY - Parameters of Probe: ET3DV6 SN:1644

# **Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) <sup>2</sup> ) <sup>A</sup>	1.85	1.95	1.93	± 10.1%
DCP (mV) <sup>8</sup>	93.6	93.0	91.9	

# **Modulation Calibration Parameters**

UID	Communication System Name	PAR		A dB	B dBuV	с	VR mV	Unc (k=2)
10000	cw	0.00	×	0.00	0.00	1.00	300	± 1.5%
			Y	0.00	0.00	1.00	300	
			z	0.00	0.00	1.00	300	

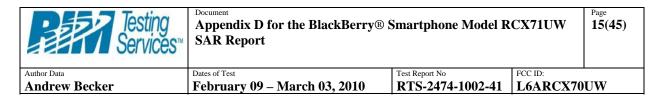
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

<sup>4</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>8</sup> Numerical linearization parameter: uncertainty not required.

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# DASY - Parameters of Probe: ET3DV6 SN:1644

### Calibration Parameter Determined in Head Tissue Simulating Media

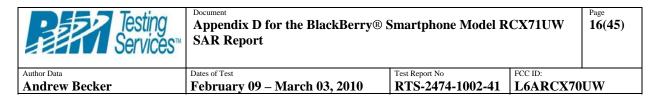
f [MHz]	Validity [MHz] <sup>G</sup>	Permittivity	Conductivity	ConvFX Co	nvFY Co	nvF Z	Alpha	Depth Unc (k=2)
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.08	6.08	6.08	0.42	2.29 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.17	5.17	5.17	0.61	2.31 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.50	4.50	4.50	0.99	1.61 ± 11.0%

<sup>©</sup> 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 - Parameters of Probe: ET3DV6 SN:1644

# Calibration Parameter Determined in Body Tissue Simulating Media

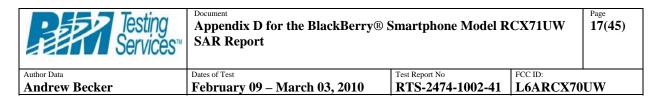
f [MHz]	Validity [MHz] <sup>G</sup>	Permittivity	Conductivity	ConvFX Cor	wFY Cor	nvF Z	Alpha	Depth Unc (k=2)
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.87	5.87	5.87	0.41	2.55 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.69	4.69	4.69	0.79	2.57 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.11	4.11	4.11	0.99	1.41 ± 11.0%

<sup>C</sup> 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.

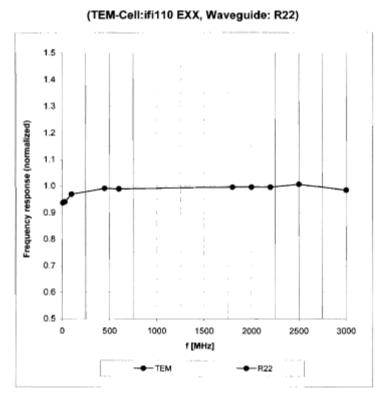
Certificate No: ET3-1644\_Nov09

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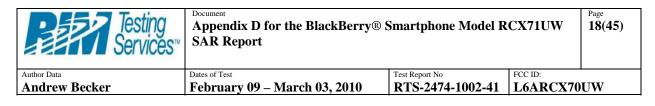
# Frequency Response of E-Field



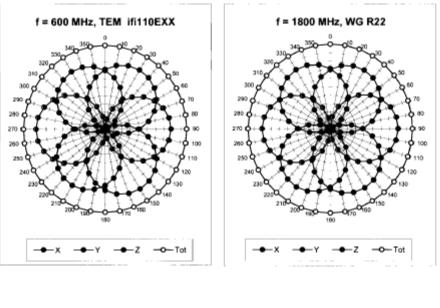
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Certificate No: ET3-1644\_Nov09

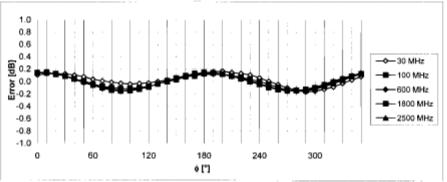
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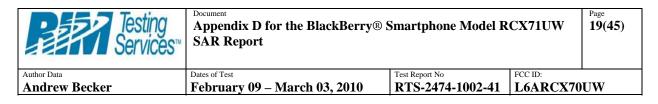
# Receiving Pattern ( $\phi$ ), $\vartheta = 0^{\circ}$



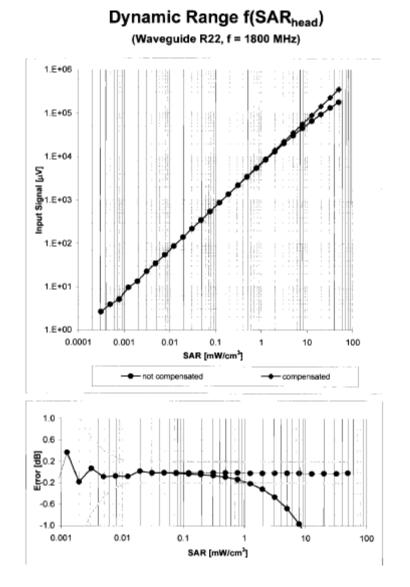
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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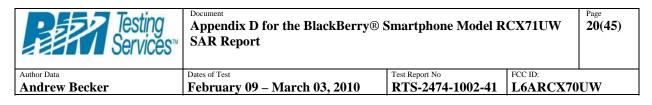
November 11, 2009



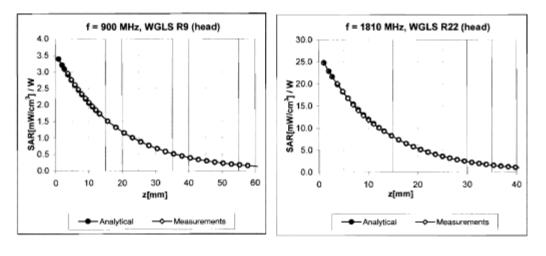
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ET3-1644\_Nov09

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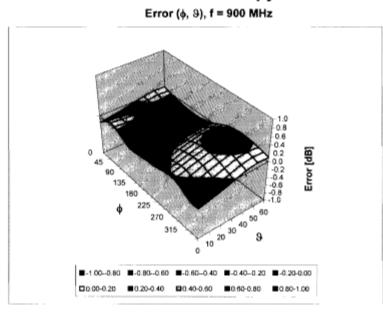


November 11, 2009



# **Conversion Factor Assessment**

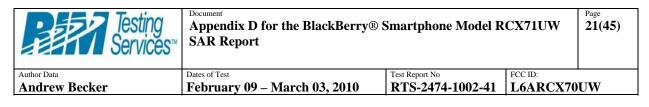
**Deviation from Isotropy in HSL** 



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

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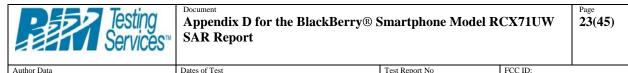
# **Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	enabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

Certificate No: ET3-1644\_Nov09

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	Dates of Test February 09 – Mai		Test Report No RTS-2474-1002-41	FCC ID: L6ARCX70U
Calibration Labor Schmid & Partner	atory of	A AN	Service suisse	er Kalibrierdienst d'étalonnace
Engineering AG Zeughausstrasse 43, 8004	Zurich, Switzerland	HAC MEA	RATI S Swiss Calibrati	ro di taratura
The Swiss Accreditation S	Accreditation Service (SAS) Service is one of the signatorie r the recognition of calibration		Accreditation No.: SCS 108	8
Client RTS ( RIM	Testing Services)		Certificate No: D835V2-44	6_Jan09
CALIBRATIO	N CERTIFICATE			
Object	D835V2 - SN: 44	6		
Calibration procedure(s)	QA CAL-05.v7 Calibration proce	dure for dipole validat	ion kits	
Calibration date:	January 05, 2009	)		
Condition of the calibrated	item In Tolerance			
The measurements and the All calibrations have been of	e uncertainties with confidence p	robability are given on the folic	the physical units of measurement owing pages and are part of the constant of	ertificate.
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled	Calibration
Designed of the second	GB37480704	08-Oct-08 (No. 217-00898)		
Power meter EPM-442A	US37292783 r SN: 5086 (20g)	08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864)	90-bO Jul-09	
Power sensor HP 8481A	Same Provide State State States	01-Jul-08 (No. 217-00867)	-lul-09	
	SN: 3025	28-Apr-08 (No. ES3-3025_/	Apr08) Apr-09	
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat Reference Probe ES3DV2		14-Mar-08 (No. DAE4-601	Mar08) Mar-09	
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat	SN: 601			Church
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat Reference Probe ES3DV2	SN: 601	Check Date (in house)	Scheduled	Grieck
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat Reference Probe ES3DV2 DAE4	20133-05			teck: Oct-09
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat Reference Probe ES3DV2 DAE4 Secondary Standards	ID # MY41092317 100005	Check Date (in house)	Oct-07) In house ch Oct-07) In house ch	
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinal Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # MY41092317 100005	Check Date (in house) 18-Oct-02 (in house check of 4-Aug-99 (in house check of	Oct-07) In house of Oct-07) In house of Oct-08) In house of Signature	seck: Oct-09 seck: Oct-09
Power sensor HP 8481A Reference 20 dB Attenuato Type-N mismatch combinat Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753	ID # MY41092317 00005 EUS37390585 S4206 Name	Check Date (in house) 18-Oct-02 (in house check ( 4-Aug-99 (in house check ( 18-Oct-01 (in house check ( Function	Oct-07) In house ch Oct-07) In house ch Oct-08) In house ch Signature hnician	seck: Oct-09 seck: Oct-09



Andrew Becker

February 09 - March 03, 2010

RTS-2474-1002-41

L6ARCX70UW

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



Schweizerischer Kalibrierdienst S Service suisse d'étalonnage

- С Servizio svizzero di taratura
  - Swiss Calibration Service

s

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 ٠ connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D835V2-446 Jan09

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Testing Services™	Document       Appendix D for the BlackBerry® Smartphone Model RCX71UW         SAR Report       Dates of Test         Dates of Test       Test Report No         FCC ID:       FCC ID:		CX71UW	Page 24(45)
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW

### Measurement Conditions

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

DASY Version	DASY5	V5.0
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 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C		

# SAR result with Head TSL

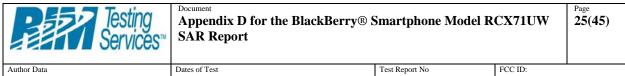
SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	9.50 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 mW / g
SAR normalized	normalized to 1W	6.32 mW / g
SAR for nominal Head TSL parameters 1	normalized to 1W	6.27 mW /g ± 16.5 % (k=2)

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

Certificate No: D835V2-446\_Jan09

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Andrew Becker

 Dates of Test
 Test Report No
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 February 09 – March 03, 2010
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 L6ARCX70UW

# Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω - 6.9 jΩ	
Return Loss	- 23.3 dB	

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 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\_Jan09

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# DASY5 Validation Report for Head TSL

Date/Time: 05.01.2009 10:38:06

Test Laboratory: SPEAG, Zurich, Switzerland

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

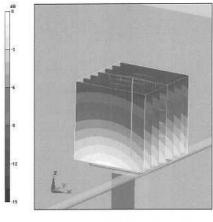
Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1 Medium: HSL 900 MHz Medium parameters used: f = 835 MHz;  $\sigma$  = 0.91 mho/m;  $\varepsilon_r$  = 41.1;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

# Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = 0.024 dBPeak SAR (extrapolated) = 3.54 W/kgSAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.58 mW/gMaximum value of SAR (measured) = 2.7 mW/g



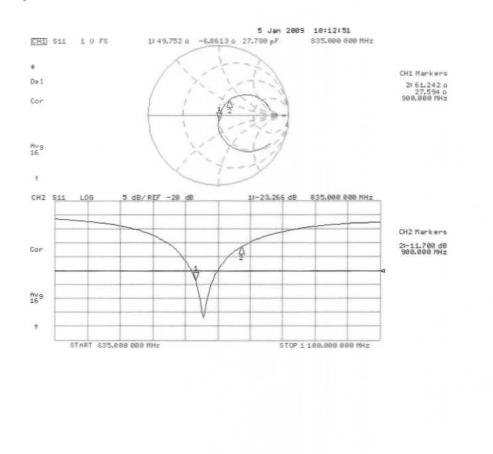
0 dB = 2.7 mW/g

Certificate No: D835V2-446\_Jan09

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Testing Services <sup>™</sup>	Document Appendix D for the BlackBerry® Smartphone Model RCX71UW SAR Report		CX71UW	Page <b>27(45)</b>
Author Data	Dates of Test Test Report No FCC ID:			
Andrew Becker	February 09 – March 03, 2010 RTS-2474-1002-41 L6ARCX70			UW

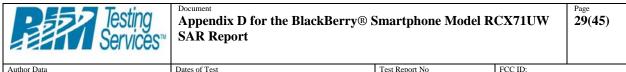
# Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446\_Jan09

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Becker	Dates of Test		Test Report No		FCC ID:
Вескег	February 09 – Marcl	h 03, 2010	RTS-2474-	1002-41	L6ARCX70U
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	Accreditation Service (SAS) Service is one of the signatorie	is to the EA	Accreditati	on No.: SC	5 108
	or the recognition of calibration				
Client RTS (RIM	Test Services)	1942	Certificate	No: D1800	V2-2d020_Jan09
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Object	D1800V2 - SN: 2	20020		And Card	Martin Street
Calibration procedure(s)	QA CAL-05.v7 Calibration proce	dure for dipole v	validation kits		
Calibration date:	January 06, 2009		No. of Concession, Name		
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Andrew Becker

February 09 - March 03, 2010

L6ARCX70UW RTS-2474-1002-41

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: D1800V2-2d020\_Jan09

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Testing Services™	Document Appendix D for the BlackBerry® S SAR Report	Smartphone Model R	Appendix D for the BlackBerry® Smartphone Model RCX71UW	
Author Data	Dates of Test	Test Report No	FCC ID:	

Andro	w Becker
Anare	w Decker

Dates of Test		FCC ID:
February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70UW

# **Measurement Conditions**

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

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

# Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5±6%	1.40 mho/m ± 6 %
Head TSL temperature during test	(21.6 ± 0.2) <sup>≠</sup> C		-

# SAR result with Head TSL

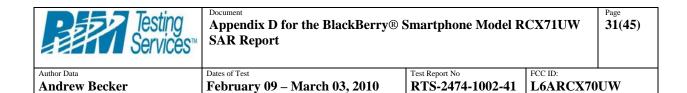
SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.57 mW /g
SAR normalized	normalized to 1W	38.3 mW /g
SAR for nominal Head TSL parameters 1	normalized to 1W	38.2 mW/g±17.0 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.04 mW /g
SAR normalized	normalized to 1W	20.2 mW /g
SAR for nominal Head TSL parameters 1	normalized to 1W	20.1 mW / g ± 16.5 % (k=2)

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

Certificate No: D1800V2-2d020\_Jan09

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### Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	45.3 Ω - 7.5 jΩ
Return Loss	- 20.6 dB

# General Antenna Parameters and Design

Electrical Delay (one direction)	1.215 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

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

# Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	September 07, 2001	

Certificate No: D1800V2-2d020\_Jan09

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# **DASY5 Validation Report for Head TSL**

Date/Time: 06.01.2009 11:22:58

Test Laboratory: SPEAG, Zurich, Switzerland

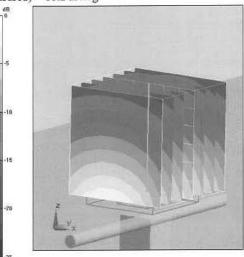
# DUT: Dipole 1800 MHz; Type: D1800V2; Serial: SN:2d020

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB Medium parameters used: f – 1800 MHz;  $\sigma$  = 1.4 mho/m;  $\epsilon_r$  = 39.6;  $\rho$  – 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC)

# DASY5 Configuration:

- Probe: ES3DV2 SN3025; ConvF(4.96, 4.96, 4.96); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 3.4 Build 45

Pin = 250 mW; dip = 10 mm, scan at 3.4mm 2/Zoom Scan (dist=3.4mm, probe 0deg) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 91.8 V/m; Power Drift = 0.036 dB Peak SAR (extrapolated) = 17.6 W/kg SAR(1 g) = 9.57 mW/g; SAR(10 g) = 5.04 mW/g Maximum value of SAR (measured) = 11.2 mW/g



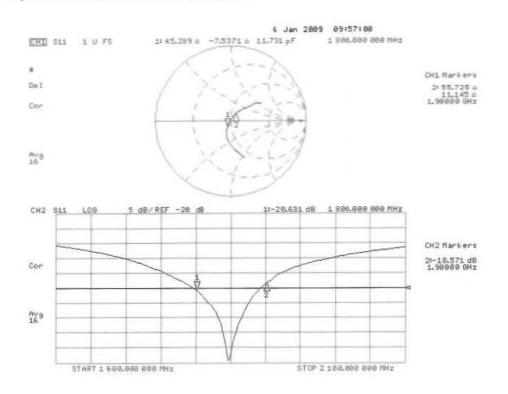
0 dB = 11.2 mW/g

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Certificate No: D1800V2-2d020_Jan09
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Testing Services™	Document Appendix D for the BlackBerry® Smartphone Model RCX71UW SAR Report		Page 33(45)	
Author Data	Dates of Test Report No FCC ID:			
Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW

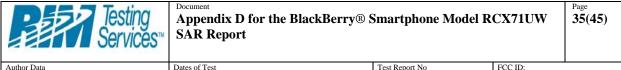
# Impedance Measurement Plot for Head TSL



Certificate No: D1800V2-2d020\_Jan09

Page 6 of 6

w Becker	Dates of Test February 09 – March	03, 2010	Test Report No <b>RTS-2474-1002-41</b>	FCC ID: L6ARCX70UW
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**Andrew Becker** 

February 09 - March 03, 2010

RTS-2474-1002-41 L6ARCX70UW

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) 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) DASY4/5 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 ٠ nominal SAR result.

Certificate No: D1900V2-545 Jan09

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Testing Services™	Document Appendix D for the BlackBerry® S SAR Report	Smartphone Model R	CX71UW	Page <b>36(45)</b>
Author Data	Dates of Test Report No FCC ID:			
Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW

# **Measurement Conditions**

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

DASY Version	DASY5	V5.0
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	39.2 ± 6 %	1.47 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	-	

# SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (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 1	normalized to 1W	39.5 mW/g±17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.29 mW/g
SAR normalized	normalized to 1W	21.2 mW/g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	20.8 mW / g ± 16.5 % (k=2)

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

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Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW

Appendix

# Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.9 Ω + 1.9 jΩ
Return Loss	- 34.4 dB

# General Antenna Parameters and Design

Electrical Delay (one direction)	1.197 ns
----------------------------------	----------

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

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

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

# Additional EUT Data

Manufactured by	SPEAG		
Manufactured on	November 15, 2001		

Certificate No: D1900V2-545\_Jan09

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# DASY5 Validation Report for Head TSL

Date/Time: 06.01.2009 13:17:58

Test Laboratory: SPEAG, Zurich, Switzerland

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

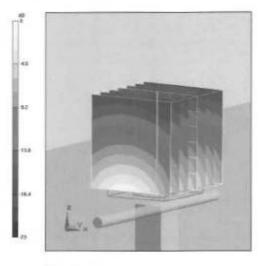
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: HSL U10 BB Medium parameters used: f = 1900 MHz;  $\sigma$  = 1.47 mho/m;  $\epsilon_r$  = 39.4;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 28.04.2008.
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

# Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 92.5 V/m; Power Drift = 0.037 dB Peak SAR (extrapolated) = 19 W/kg SAR(1 g) - 10.2 mW/g; SAR(10 g) - 5.29 mW/g Maximum value of SAR (measured) = 12 mW/g



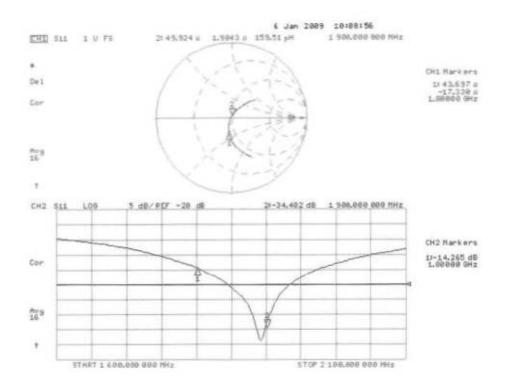
 $0 \mathrm{\,dB} = 12\mathrm{mW/g}$ 

Certificate No: D1900V2-545\_Jan09

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Testing Services™	Appendix D for the BlackBerry® Smartphone Model RCX71UW SAR Report		Page <b>39(45)</b>	
Author Data	Dates of Test	Test Report No	FCC ID:	
Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6ARCX70	UW

# Impedance Measurement Plot for Head TSL



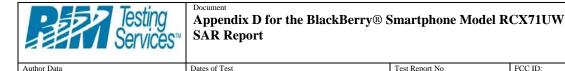
Certificate No: D1900V2-545\_Jan09

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Accredited by the Swiss Accredita The Swiss Accreditation Service Multilateral Agreement for the re	is one of the signatorie	s to the EA	tion No.: SCS 108	
Client RTS (RIM Testi	ng Services)	Certificate	No: D2450V2-747_Nov09	í
CALIBRATION C	ERTIFICATE			
Object	D2450V2 - SN: 7	47	A. I. S. L. C. C.	
Calibration procedure(s)	QA CAL-05.v7 Calibration proce	dure for dipole validation kits		
Calibration date:	Maxmanhar 14 M	00	はったいことになるまです。	
	November 11, 20			
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Andrew Becker

# February 09 – March 03, 2010

Test Report No FCC ID: **RTS-2474-1002-41 L6ARCX70UW** 

# Calibration Laboratory of

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



- SHISS SPECE PECABRATION S
  - Schweizerischer Kalibrierdienst
  - Service suisse d'étalonnage
  - Servizio svizzero di taratura
  - Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

# Glossary:

TSL	tissue simulating liquid
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

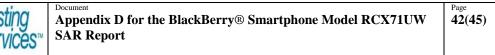
# Additional Documentation:

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: D2450V2-747\_Nov09



Author Data	
Andrew Becker	

 Dates of Test
 Test Report No
 FCC ID:

 February 09 – March 03, 2010
 RTS-2474-1002-41
 L6ARCX70UW

# 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	

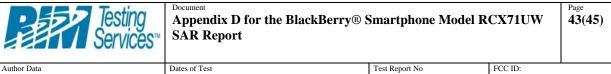
# Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mha/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 <sup>3</sup> (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)	
SAP averaged over 10 cm <sup>3</sup> (10 c) of Head TSI	condition		
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition		
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL SAR measured	condition 250 mW input power	6.23 mW / g	
		6.23 mW / g 24.9 mW / g	
SAR measured	250 mW input power		



Andrew Becker	February 09 – March 03, 2010	RTS-2474-1002-41	L6A
Author Data	Dates of Test	Test Report No	FCC ID

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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

Electrical Delay (one direction)	1.161 ns
1	

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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Author Data
Andrew Becker

 Test Report No
 I

 3, 2010
 RTS-2474-1002-41
 I

FCC ID: 2-41 L6ARCX70UW

# **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;  $\epsilon_r$  = 39.2;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

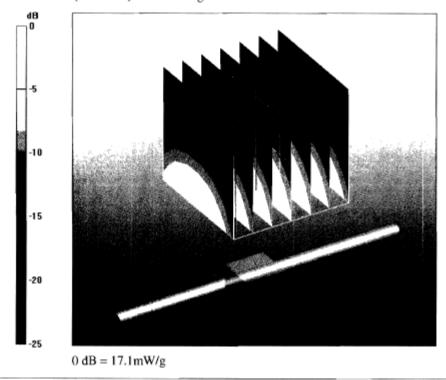
DASY5 Configuration:

- 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=5mmReference 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

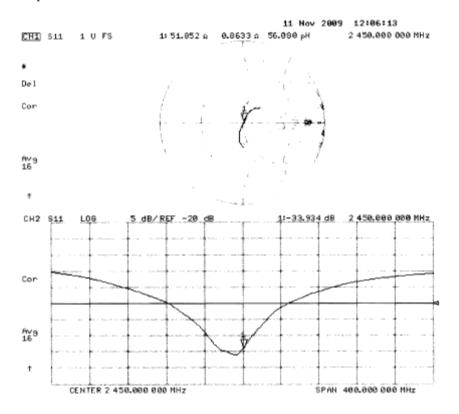


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Testing Services <sup>™</sup>	Appendix D for the BlackBerry® Smartphone Model RCX71UW SAR Report		Page 45(45)	
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# Impedance Measurement Plot for Head TSL



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