RTS RIM Testing Services	Document Appendices for the BlackBe RBP41GW SAR Report	erry Wireless Handheld	Model	Page 1(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

	'S sting Services				Model	Page 2(32
r Data Dud A	Attayi	Dates of Test Feb. 05-27, 20	07 Test Report No RTS-0628	8-0702-08	FCC ID: L6ARBP40	GW
	Calibration Laborat Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zu		ACCENTRA (PRISS) SC	Schweizerische Service suisse Servizio svizzer Swiss Calibrati	o di taratura	
	Accredited by the Swiss Feder The Swiss Accreditation Serv Multilateral Agreement for th	al Office of Metrology and A vice is one of the signator	Correditation Accreditation les to the EA n certificates	No.: SCS 108		
	Cilent RIM	OFDIELOAT		: ET3-1643_1	waruo	
	CALIBRATION	CERTIFICAT	E			
	Object	ET3DV6 - SN:1	643			
	Calibration procedure(s)	QA CAL-01.v5 Calibration proc	edure for dosimetric E-field probe	5		
	Calibration date:	March 16, 2006				
	Condition of the calibrated iten	In Tolerance			No.	
)	The measurements and the un	ncertainties with confidence ducted in the closed laborat	tional standards, which realize the physical un probability are given on the following pages an ory facility: environment temperature $(22 \pm 3)^{\circ}$	d are part of the ce	rtificate.	
	Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled (	Calibration	
	Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06		
	Power sensor E4412A Power sensor E4412A	MY41495277 MY41498087	3-May-05 (METAS, No. 251-00466) 3-May-05 (METAS, No. 251-00466)	May-06 May-06		
	Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06		
	Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06		
	Reference 30 dB Attenuator Reference Probe ES3DV2	SN: S5129 (30b) SN: 3013	11-Aug-05 (METAS, No. 251-00500) 2-Jan-06 (SPEAG, No. ES3-3013 Jan06)	Aug-06 Jan-07		
	DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)			
	Secondary Standards	ID#	Check Date (in house)	Scheduled (	Check	
		US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05			
	RF generator HP 8648C	LICOTODOEDE	18-Oct-01 (SPEAG, in house check Nov-0		ack: Nov 06	
		US37390585				
	RF generator HP 8648C Network Analyzer HP 8753E	Name	Function	Signature		
	RF generator HP 8648C		Function Technical Manager	Signature	· Vat-	
	RF generator HP 8648C Network Analyzer HP 8753E	Name		Signature	they -	
	RF generator HP 8648C Network Analyzer HP 8753E Calibrated by: Approved by:	Name Katja Pokovic Niels Kuster	Technical Manager	N.J.	Hat 8 b 18, 2006	
	RF generator HP 8648C Network Analyzer HP 8753E Calibrated by: Approved by: This calibration certificate shall	Name Katja Pokovic Niels Kuster	Technical Manager Quality Manager	N.J.	124 2016	
	RF generator HP 8648C Network Analyzer HP 8753E Calibrated by: Approved by:	Name Katja Pokovic Niels Kuster	Technical Manager Quality Manager	N.J.	124 2016	

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RTS RIM Testing Services	Appendices for the Black RBP41GW SAR Report	kBerry Wireless Handheld	Model	Page 3(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

Calibration Laboratory of Schmid & Pertner Engineering AG Zaughausstresse 43, 8004 Zurich, Switzerland



Schweizerischer Kallbrierd s Service suisse d'étalonnage С

- Servizio svizzaro di taratura
- Swiss Calibration Service

Accorditation No.: SCS 108

Accredited by the Swiss Federal Office of Metrology and Accreditation The Series 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
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization $\phi$	origination around probe axis
Polarization 9	9 rotation around an axis that is in the plane normal to probe axis (at
	measurement center), i.e., 3 = 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) 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

#### Methods Applied and Interpretation of Parameters:

- NORMX, y.z: Assessed for E-field polarization  $\vartheta = 0$  (f  $\leq 900$  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.

Certificate No: ET3-1643 Mar06

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Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

ET30V6 SN:1643

March 16, 2006

# Probe ET3DV6

# SN:1643

Manufactured: Last calibrated: Recalibrated: November 7, 2001 March 15, 2005 March 16, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system()

Certificate No: ET3-1643\_Mar06

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#### March 16, 2006

# DASY - Parameters of Probe: ET3DV6 SN:1643

	in Free Spa	ice <sup>A</sup>		Diode	e Compression
Norm	1X 1	.78 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP X	94 mV
Norm	1Y 1	.90 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Y	94 mV
Norm	1Z 1	.79 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	94 mV
Sensitivity	in Tissue Si	mulating Li	quid (Conver	rsion Factor	rs)
Please see Pa	ge 8.				
Boundary I	Effect				
TSL	900 MHz	Typical SA	R gradient: 5 %	per mm	
Senso	r Center to Phan	tom Surface Di	stance	3.7 mm	4.7 mm
SARte	[%] Witho	out Correction A	lgorithm	8.3	4.4
SARbe	[%] With	Correction Algo	rithm	0.0	0.2
TSL	1810 MHz	Typical SA	R gradient: 10 %	per mm	
Senso	r Center to Phan	tom Surface Di	stance	3.7 mm	4.7 mm
SARte	[%] Witho	ut Correction A	Igorithm	7.1	3.8
SARce	[%] With (	Correction Algo	rithm	0.4	0.3
Sensor Off	set				
Probe	Tip to Sensor Ce	enter		2.7 mm	
measuremen	it multiplied by	y the coverag	nt is stated as e factor k=2, w of approximatel	hich for a nor	uncertainty of mal distribution
16					
1		affect the E <sup>2</sup> -field u	ncertainty inside TSL (	(see Page 8).	
The uncertainties	of NormX,Y,Z do not				
	of NormX,Y,Z do not tation parameter: unc				

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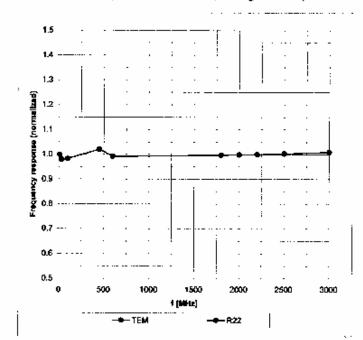
RTS RIM Testing Services	Document Appendices for the BlackBer RBP41GW SAR Report	rry Wireless Handheld	Model	Page 6(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

#### ET3DV6 \$N:1643

March 16, 2006

# **Frequency Response of E-Field**

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



Uncertainty of Frequency Response of E-field: ± 8.3% (k=2)

Cartilleate No: ET3-1643\_Mar06

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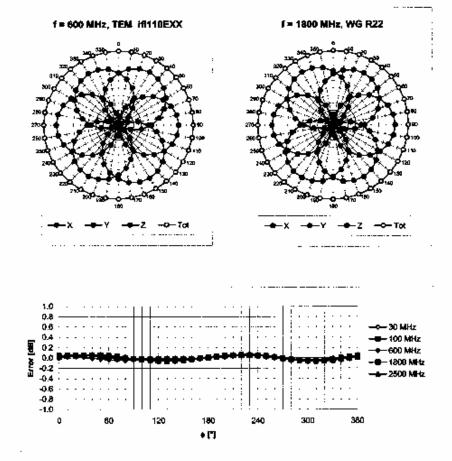
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Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

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March 16, 2006

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

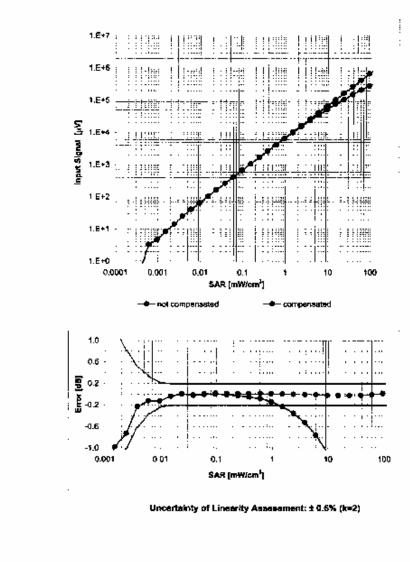
Certificate No: ET3-1643\_Mar06

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Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

March 16, 2006



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

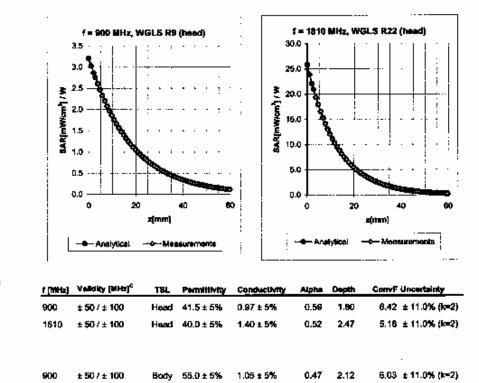
Certificate No: ET3-1643\_Mar06

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RTS RIM Testing Services	Document Appendices for the BlackB RBP41GW SAR Report	erry Wireless Handheld	Model	Page 9(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

#### March 16, 2006



## **Conversion Factor Assessment**

<sup>4</sup> The validity of ± 180 MHz only upplies for DASY v4.4 and higher (see Page 2). The uncertainty in the RBS of the ComF uncertainty at calibration frequency and the uncertainty for the indicated frequency bend.

Body 53.3 ± 5%

Certificate No: ET3-1843\_Mar06

1810

 $\pm 50 / \pm 100$ 

Page 6 of 9

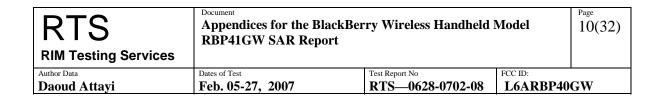
 $1.62 \pm 5\%$ 

0.52

2.87

4.67 ± 11.0% (k=2)

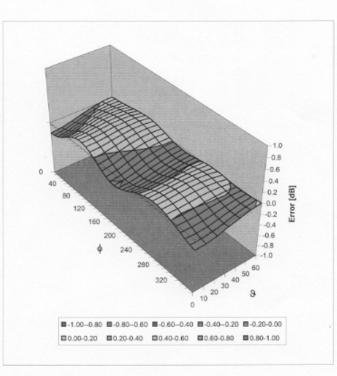
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March 16, 2006

### Deviation from Isotropy in HSL

Error (0, 9), f = 900 MHz



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

Certificate No: ET3-1643\_Mar06

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Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

RTS RIM Testing Services					<sup>Page</sup> 12(32	
Author Data Daoud Attayi		eb. 05-27, 2007	Test Report No <b>RTS-0628-07</b>	est Report No RTS-0628-0702-08		W
Schm Eng Zeughau Accredit The Swi	iss Accreditation Se	iii	tion Accreditat e EA cates	S Service C Servizio S Swiss C	zerischer Kalibrierdienst e suisse d'étalonnage o svizzero di taratura Calibration Service CS 108	
					001201000000000000000	
Object		ET3DV6 - SN:1644				

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Cal Date (Calibrated by, Certificate No.)

5-Apr-06 (METAS, No. 251-00557)

5-Apr-06 (METAS, No. 251-00557)

5-Apr-06 (METAS, No. 251-00557)

10-Aug-06 (METAS, No. 217-00592)

4-Apr-06 (METAS, No. 251-00558)

Check Date (in house)

Page 1 of 9

10-Aug-06 (METAS, No. 217-00593)

2-Jan-06 (SPEAG, No. ES3-3013\_Jan06)

21-Jun-06 (SPEAG, No. DAE4-654\_Jun06)

4-Aug-99 (SPEAG, in house check Nov-05)

18-Oct-01 (SPEAG, in house check Oct-06)

Technical Manager

Quality Manager

Function

Scheduled Calibration

Apr-07

Apr-07

Apr-07

Aug-07

Apr-07

Aug-07

Jan-07

Jun-07

Signature

Scheduled Check

In house check: Nov-07

In house check: Oct-07

Issued: November 16, 2006

November 16, 2006

In Tolerance

ID # G841293874

MY41495277

MY41498087

SN: S5054 (3c)

SN: S5088 (20b)

SN: S5129 (30b)

US3642U01700

US37390585

Katja Pokovic

Niels Kuster

SN: 3013

SN: 654

1D #

Name

Calibration date:

Primary Standards

Power meter E44198

Power sensor E4412A

Power sensor E4412A

Reference 3 dB Attenuator

Reference 20 dB Attenuator

Reference 30 dB Attenuator

Reference Probe ES3DV2

Secondary Standards

Calibrated by:

Approved by:

RF generator HP 8648C

Network Analyzer HP 8753E

Certificate No: ET3-1644\_Nov06

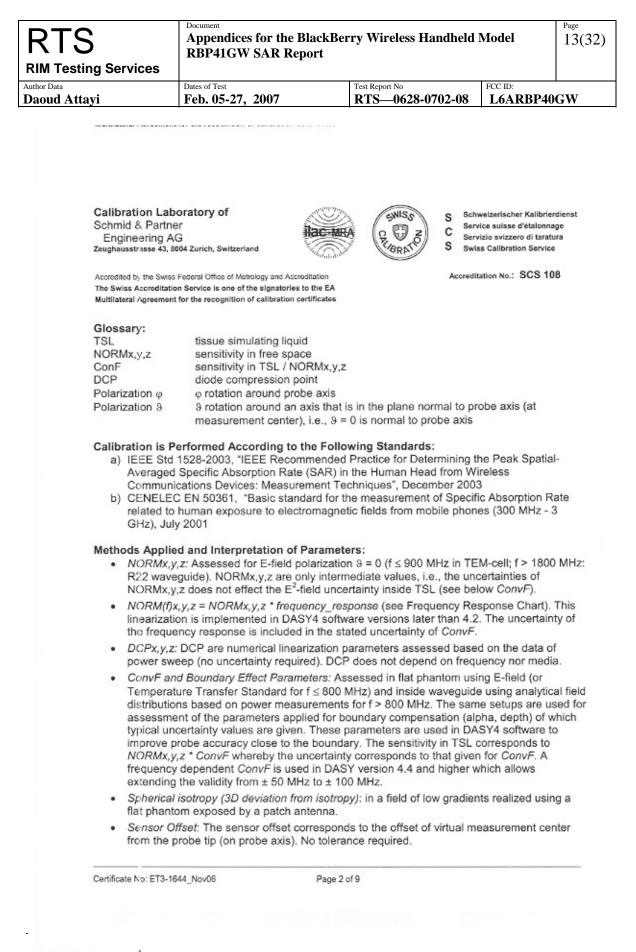
DAE4

Condition of the calibrated item

Calibration Equipment used (M&TE critical for calibration)

1.					
	лшин wi	iuiout ur	C W110	лионать	

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RTS RIM Testing Services	Document Appendices for the BlackB RBP41GW SAR Report	erry Wireless Handheld	Model	Page 14(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

November 16, 2006

# Probe ET3DV6

# SN:1644

Manufactured: Last calibrated: Recalibrated: November 7, 2001 November 11, 2005 November 16, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1644\_Nov06

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#### ET3DV6 SN:1644

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November 16, 2006

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## DASY - Parameters of Probe: ET3DV6 SN:1644

Sensitivity in Free	e Space <sup>A</sup>	Diode Compression <sup>E</sup>		ompression <sup>B</sup>
NormX	1.80 ± 10.1%	$\mu$ V/(V/m) <sup>2</sup>	DCP X	95 mV
NormY	1.93 ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Y	94 mV
NormZ	1.89 ± 10.1%	μV/(V/m) <sup>2</sup>	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 <sub>be</sub> [%]	Without Correction Algorithm	8.3	4.3
SAR <sub>b#</sub> [%]	With Correction Algorithm	0.0	0.2

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	15.5	10.2
SAR <sub>be</sub> [%]	With Correction Algorithm	0.5	0.2

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

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

Certificate No: ET3-1644\_Nov06

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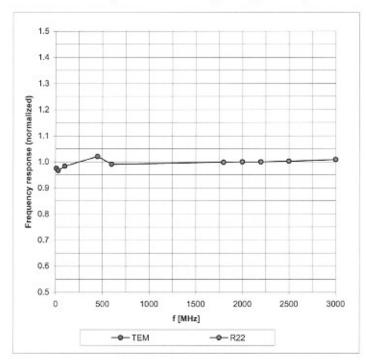
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Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

November 16, 2006

# Frequency Response of E-Field

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



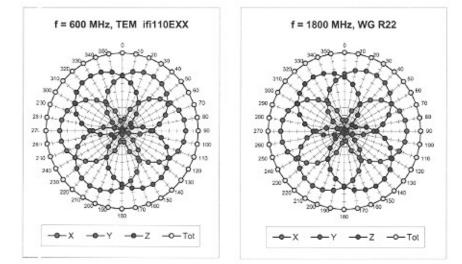
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)



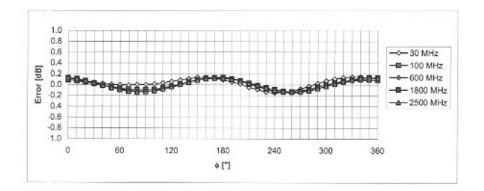
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Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

November 16, 2006



# 



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

Certificate No: ET3-1644\_Nov06

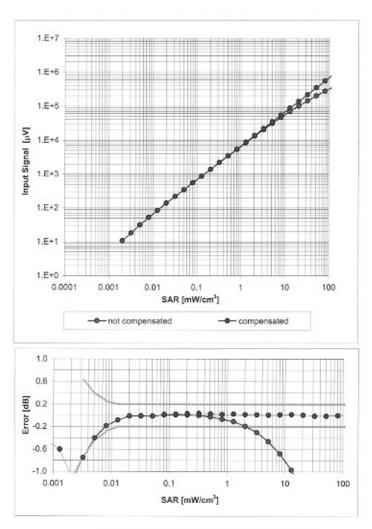
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RTS RIM Testing Services	Document Appendices for the Bla RBP41GW SAR Repor	ckBerry Wireless Handheld t	Model	Page 18(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

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November 16, 2006



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

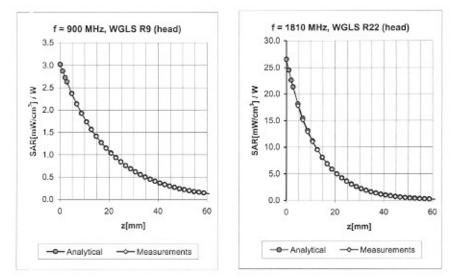
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ET3-1644 Nov06

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November 16, 2006



## **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%	0.36	2.34	6.43 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.49	2.64	5.07 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.31	2.89	6.02 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.62	2.65	4.66 ± 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.

Certificate No: ET3-1644\_Nov06

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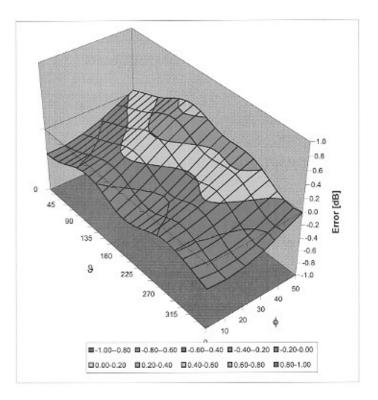
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Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

November 16, 2006

# **Deviation from Isotropy in HSL**

Error (¢, ୬), f = 900 MHz



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

Certificate No: ET3-1644\_Nov06

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<b>-</b> S			
	ates of Test	Test Report No RTS-0628-0702-08	FCC ID: L6ARBP40GW
Attayi I	Teb. 05-27, 2007	K15-0028-0702-08	LOAKDF 40G V
Calibration Laborat Schmid & Partner Engineering AG Zeughausstrasse 43, 804 Z			chweizerischer Kalibrierdier ervice suisse d'étalonnage ervizio svizzero di taratura wiss Calibration Service
Accredited by the Swiss Feder The Swiss Accreditation Ser Multilateral Agreement for th	vice is one of the signatorie	s to the EA	SCS 108
Client RIM			835V2-446_Jan07
CALIBRATION	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		X-92-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-
Condition of the calibrated ite	In Tolerance		
		onal standards, which realize the physical units of robability are given on the following pages and are	
All calibrations have been cor	ducted in the closed laborator	y facility: environment temperature (22 ± 3)°C and	1 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 (Hf DAE4	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 (10r) P) SN 1507 SN 907	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_Jul/06)	Scheduled Calibration Oct-07 Oct-07 Aug-07 Aug-07 Oct-07 Jul-07
Secondary Standards	ID#	Check Date (in house)	Scheduled Check
Power sensor HP 8481A RF generator Agient E4421B Network Analyze: HP 8753E	MY41092317 MY41000675 US37390585 S4206	18-Oct-02 (SPEAG, in house check Oct-05) 11-May-05 (SPEAG, in house check Nov-05) 18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07 In house check: Nov-07 In house check: Oct-07
Calibrated by:	Name Marcel Fehr	Function Laboratory Technician	Signature M. A.M.
Approved by:	Katja Pokovic	Technical Manager	Phic Ver
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Certificate No: D835V2-446\_Jan07

Page 1 of 6

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RTS RIM Testing Services	Document Appendices for the Bla RBP41GW SAR Repor	ckBerry Wireless Handheld t	Model	Page 22(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

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

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

#### 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: D835V2-446\_Jan07

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RTS RIM Testing Services	Appendices for the BlackBerry Wireless Handheld Model RBP41GW SAR Report		Page 23(32)	
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	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	

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#### 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 <sup>3</sup> (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 <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 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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RTS RIM Testing Services	Document Appendices for the BlackBer RBP41GW SAR Report	rry Wireless Handheld I	Model	Page 24(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	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	

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

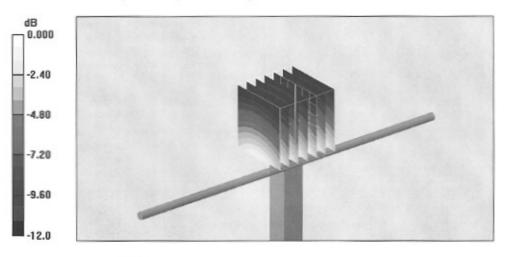
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1 Medium: HSL 900 MHz; Medium parameters used: f = 835 MHz;  $\sigma$  = 0.88 mho/m;  $\epsilon_r$  = 40.3;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

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



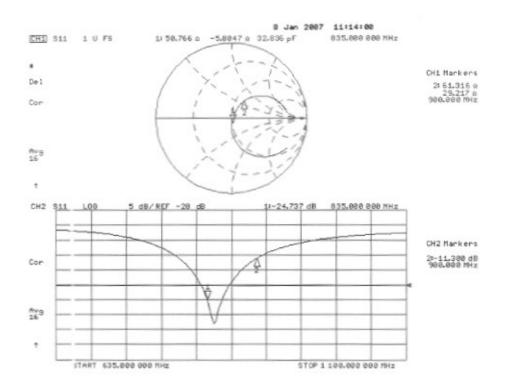
0 dB = 2.51mW/g

Certificate No: D835V2-446\_Jan07

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RTS RIM Testing Services	Document Appendices for the BlackBer RBP41GW SAR Report	rry Wireless Handheld	Model	Page 26(32)
Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446\_Jan07

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esting Services		endices for the BlackBerry Wireless Handheld Model 27(32) Page 27(32)		
Attayi	Dates of T Feb. 0	<sup>est</sup> <b>5-27, 2007</b>	Test Report No RTS-0628-0702-08	FCC ID: L6ARBP40GW
Calibration I Schmid & Pa Engineering	rtner g AG			Schweizerischer Kalibrierdienst Service suïsse d'étalonnage Servizio svizzero di taratura
The Swiss Accred	owiss Federal C litation Service	n, switzenand Mice of Metrology and Ac a is one of the signatoric prognition of calibration	creditation Accreditation No.	swiss Calibration Service
Client RIM		0.000	Certificate No: 1	D1900V2-545_Jan07
CALIBRA	TION C	ERTIFICATE		North Contraction of the
Object		D1900V2 - SN: 5	45	
Calibration proced	ure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits	
Calibration date:		January 9, 2007		NUCLEAR AND
Condition of the ca	alibrated item	In Tolerance		
This calibration ce The measurement All calibrations hav	rtificate docum is and the unce we been conduc	ents the traceability to nati rtainties with confidence p	onal standards, which realize the physical units robability are given on the following pages and a ry facility: environment temperature (22 ± 3)*C a	ire part of the certificate.
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Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst

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

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

#### 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:

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  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 cm3 (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 <sup>3</sup> (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)

<sup>&</sup>lt;sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

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#### 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

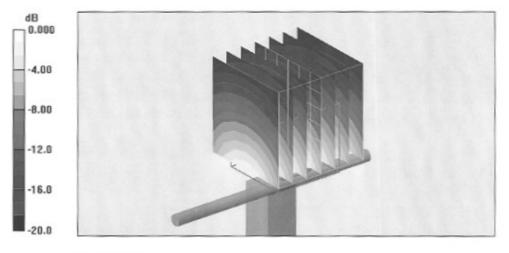
#### DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

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/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

#### DASY4 Configuration:

- Proba: 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



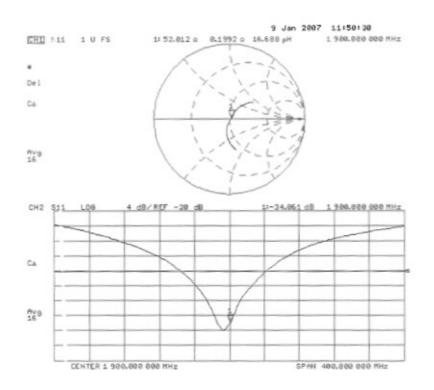
0 dB = 10.7mW/g

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Author Data	Dates of Test	Test Report No	FCC ID:	
Daoud Attayi	Feb. 05-27, 2007	RTS-0628-0702-08	L6ARBP40	GW

## Impedance Measurement Plot for Head TSL



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