RTS RIM Testing Services	Appendices for the BlackBer Model RAP31GW SAR Rep	•	andheld	Page 1(24)
Author Data Lauren Weber	Dates of Test August 02 - August 04, 2005	Test Report No RTS-0248-0508-02	FCC ID: L6ARAP	31GW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

RTS RIM Testing Services	SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW				
Author Data	Dates of Test	Test Report No	FCC ID:		
Lauren Weber	August 02 – August 04, 2005	RTS-0248-0508-02	L6ARA	AP31GW	



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Accreditation No.: SCS 108

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Client RIM Certificate No: ET3-1642\_Jan05

Object	ET3DV6 - SN:1	642	
Calibration procedure(s)	QA CAL-01.v5 Calibration proc	edure for dosimetric E-field probes	
Calibration date:	January 7, 2005	; ·	
Cond tion of the calibrated item	In Tolerance		
The measurements and the unce	ertainties with confidence	tional standards, which realize the physical units of probability are given on the following pages and an ory facility: environment temperature $(22\pm3)^{\circ}$ C and	e part of the certificate.
Primary Stancards		Cal Date (Calibrated by, Certificate No.)	Schoduled Calibration
Power motor E4419B	GB41293874	5-May-04 (METAS, No. 251-00388)	Mav-05
Power sensor E44' 2A	MY41495277	5-May-04 (METAS, No. 251-00388)	May 05
Reference 3 dB Attenuator	: SN: S5054 (3c)	10-Aug-04 (METAS, No. 251 00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (META5, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN 3013	7-Jan-35 (\$PEAG, No. E\$3-3013 Jan05)	Jan-06
DAE4	] SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-05
econdary Standards	IC #	Check Date (in house)	Scheduled Check
ower sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct D5
RF generator MP 8648C	U\$3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05
	Name	Function	Signature
	Nico Vetterli	Laboratory Technician	1) Xette
Calibratec by:			, ,
Calibrated by Approved by:	Kalja Pokovic	Technical Manager	Disette Haris Katyo



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C Service suisse d acatorinage Servizio svizzero di taratura S Swiss Calibration Service

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#### Glossary:

alaaaliyi	
TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization 9	9 rotation around an axis that is in the plane normal to probe axis (at
	measurement center), i.e., $\vartheta = 0$ 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) 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 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 (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: ET3-1642\_Jan05

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Page 2 of 9

RTS RIM Testing Services	1 1	SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW				
Author Data	Dates of Test	Test Report No	FCC ID:			
Lauren Weber	August 02 – August 04, 2005   RTS-0248-0508-02   L6ARAP31G					

January 7, 2005

# Probe ET3DV6

## SN:1642

Manufactured: Last calibrated: Recalibrated: November 7, 2001 August 31, 2004 January 7, 2005

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1642\_Jan05

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Page 3 of 9

#### January 7, 2005

## DASY - Parameters of Probe: ET3DV6 SN:1642

Sensitivity in F	Free Space	٨		Diode	Compression <sup>B</sup>
NormX	1.64	± 10.1%	μV/(V/m) <sup>2</sup>	DCP X	94 mV
NormY	1.88	t ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Y	94 mV
NormZ	1.62	<b>t</b> ± 10.1%	μV/(V/m) <sup>2</sup>	DCP Z	94 mV
Sensitivity in 7	lissue Sim	ulating Li	quid (Conver	sion Factor	s)
Please see Page 8	•				
Boundary Effe	ect				
TSL	900 MHz	Typical SA	R gradient: 5 %	per mm	
Sensor Ce	nter to Phanto	m Surface D	istance	3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without	Correction A	lgorithm	9.1 1	4.9
SAR <sub>be</sub> [%]	With Co	rrection Algo	rithm	0.0	0.2
TSL	1810 MHz	Typical SA	AR gradient: 10 %	per mm	
Sensor Ce	nter to Phanto	n Surface D	istance	3.7 mm	4.7 mm
SAR <sub>be</sub> [%]	Without	Correction A	Jgorithm	13.4	9.0
SAR <sub>be</sub> [%]	With Co	rrection Algo	rithm	1.0	0.0
Sensor Offset					
Probe Tip	to Sensor Cent	ter		2.7 mm	
The reported un measurement m corresponds to	ultiplied by f	he coverag	ge factor k=2, w	hich for a nor	-
<sup>A</sup> The uncertaintles of No <sup>B</sup> Numerical linearization			-	(see Page 8).	

Certificate No: ET3-1642\_Jan05

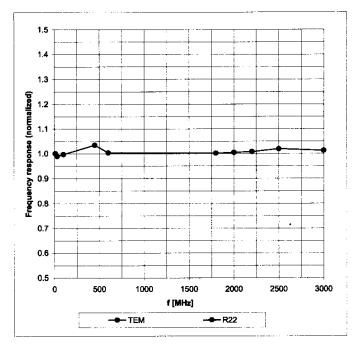
Page 4 of 9

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model	•	7285	Page 6(24)	
Author Data Lauren Weber	Dates of Test         Test Report No         FCC ID:           August 02 - August 04, 2005         RTS-0248-0508-02         L6ARAP.				

January 7, 2005

## **Frequency Response of E-Field**

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



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

Certificate No: ET3-1642\_Jan05

Page 5 of 9

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model	No. RAP31GW		Page 7(24)	
Author Data	Dates of Test	Test Report No	FCC ID:		
Lauren Weber	August 02 – August 04, 2005 RTS-0248-0508-02 L6ARAP310				

January 7, 2005

## f = 600 MHz, TEM ifi110EXX f = 1800 MHz, WG R22 Tot **O** Z 1.0 0.8 0.6 30 MHz 0.4 - 100 MHz Error [dB] 0.4 600 MHz - 1800 MHz - 2500 MHz -0.4 -0.6 -0.8 -1.0 0 60 120 180 240 300 360 ¢ [°]

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

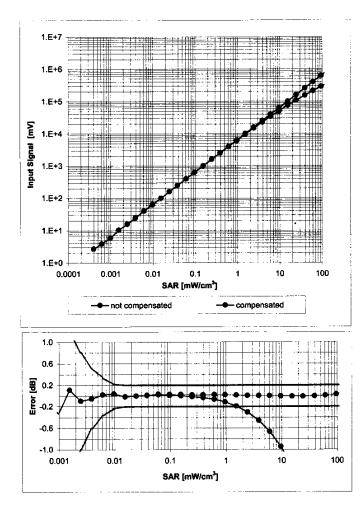
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ET3-1642\_Jan05

Page 6 of 9

RTS RIM Testing Services	1 1	SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW			
Author Data	Dates of Test	Test Report No	FCC ID:		
Lauren Weber	August 02 – August 04, 2005   RTS-0248-0508-02   L6ARAP31G				

January 7, 2005



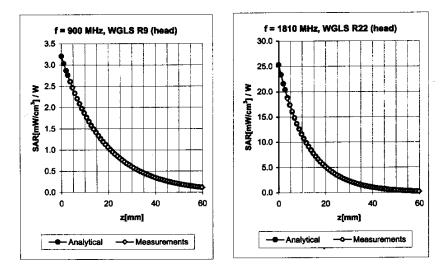
## Dynamic Range f(SAR<sub>head</sub>) (Waveguide R22, f = 1800 MHz)

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

Certificate No: ET3-1642\_Jan05

Page 7 of 9

#### January 7, 2005



#### **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%	0.65	1.81	6.52 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.62	2.32	5.29 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.53	2.11	6.18 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.58	2.76	4.78 ± 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: ET3-1642\_Jan05

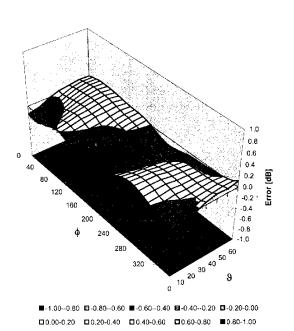
Page 8 of 9

RTS	SAR Compliance Test Rep	Page		
RIM Testing Services	Wireless Handheld Model	10(24)		
Author Data Lauren Weber	Dates of Test August 02 – August 04, 2005	Test Report No RTS-0248-0508-02	FCC ID:	P31GW

January 7, 2005

## **Deviation from Isotropy in HSL**

Error (φ, ϑ), f = 900 MHz



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

Certificate No: ET3-1642\_Jan05

Page 9 of 9

RTS RIM Testing Services	SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW				
Author Data	Dates of Test	Test Report No	FCC ID:		
Lauren Weber	August 02 – August 04, 2005 RTS-0248-0508-02 L6ARA			P31GW	



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Certificate No: D835V2-446\_Jan05

Accreditation No.: SCS 108

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ALIONATION	ERTIFICATE		
Dbject	D835V2 - SN: 44	6	
alibration procedure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits	
alibration date:	January 7, 2005	an a	
Condition of the calibrated item	In Tolerance		
		onal standards, which realize the physical units of	
		robability are given on the following pages and are by facility: environment temperature $(22 \pm 3)^{\circ}$ C and	
		y lacinty, environment temperature (22 ± 37 0 and	richindiky 47676.
alibration Equipment used (M&	TE critical for calibration)		
nimary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
ower meter EPM E442	GB37480704 U\$37292783		
Power meter EPM E442 Power sensor HP 8481A		12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402)	Oct-05
ower meter EPM E442 ower sensor HP 8481A Reference 20 dB Attenuator	U\$37292783	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412)	Oct-05 Oct-05 Aug-05 Aug-05
ower meter EPM E442 ower sensor HP 8481A eference 20 dB Attenuator eference 10 dB Attenuator	U\$37292783 SN: 5086 (20g)	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402)	Oct-05 Oct-05 Aug-05
awer meter EPM E442 bower sensor HP 8481A leference 20 dB Attenuator leference 10 dB Attenuator leference Probe ET3DV6	US37292783 SN: 5086 (20g) SN: 5047.2 (10r)	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402)	Oct-05 Oct-05 Aug-05 Aug-05
Power meter EPM E442 Power sensor HP 8481A telerence 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 AAE4	US37292783 SN: 5086 (20g) SN: 5047.2 (10r) SN 1507	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards	US37292783 SN: 5086 (20g) SN: 5047.2 (10r) SN 1507 SN 907	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (METAS, No. 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 Oct-05 May-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Recondary Standards Power sensor HP 8481A	US37292783 SN: 5086 (20g) SN: 5047.2 (10r) SN 1507 SN 907	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 Oct-05 May-05 Scheduled Check
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03	U\$37292783 SN: 5086 (20g) SN: 5087.2 (10r) SN 1507 SN 907 ID # MY41092317	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 May-05 Scheduled Check In house check: Oct-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03 Network Analyzer HP 8753E	U\$37292783 SN: 5086 (20g) SN: 5087.2 (10r) SN 1507 SN 907 ID # MY41092317 100698	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03	US37292783 SN: 5086 (20g) SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317 100698 US37390585 S4206	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No. 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03) Oct-01 (SPEAG, in house check Nov-04)	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03 Network Analyzer HP 8753E Celibrated by:	US37292783 SN: 5086 (20g) SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317 100698 US37390585 S4206 Name	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No. 251-00402) 10-Aug-04 (METAS, No. 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Oct-03) Oct-01 (SPEAG, in house check Nov-04) Function	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov-05
Power meter EPM E442 Power sensor HP 8481A Reference 20 dB Attenuator Reference 20 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03 Network Analyzer HP 8753E	US37292783 SN: 5086 (20g) SN: 5086 (20g) SN: 5047.2 (10r) SN 907 ID # MY41092317 100698 US37390585 S4206 Name Judith Müller	12-Oct-04 (METAS, No. 251-00412) 12-Oct-04 (METAS, No. 251-00412) 10-Aug-04 (METAS, No 251-00402) 10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03) Oct-01 (SPEAG, in house check Nov-04) Function Lieboratory Technician	Oct-05 Oct-05 Aug-05 Aug-05 Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov-05

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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 Jan05

Page 2 of 6

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model	•	7285	Page 13(24)
Author Data Lauren Weber	Dates of Test August 02 – August 04, 2005	Test Report No RTS-0248-0508-02	FCC ID: L6ARA	AP31GW

#### **Measurement Conditions**

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

DASY Version	DASY4	V4.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
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	42.2 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	2.27 mW / g
SAR normalized	normalized to 1W	9.08 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	9.10 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	1.48 mW / g
SAR normalized	normalized to 1W	5.92 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	5.93 mW / g ± 16.5 % (k=2)

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

Certificate No: D835V2-446\_Jan05

Page 3 of 6

#### Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 7.1 jΩ
Return Loss	- 22.9 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\_Jan05

Page 4 of 6

#### **DASY4 Validation Report for Head TSL**

Date/Time: 01/07/05 15:08:43

Test Laboratory: SPEAG, Zurich, Switzerland

#### DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN446

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;  $\varepsilon_r = 42.2$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

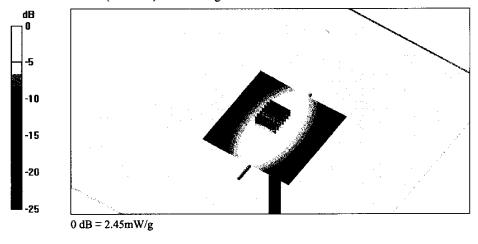
**DASY4** Configuration:

- Probe: ET3DV6 SN1507; ConvF(6.24, 6.24, 6.24); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 03.05.2004
- Phantom: Flat Phantom 4.9L; Type: QD000P50AA; Serial: SN:1001;
- Measurement SW: DASY4, V4.4 Build 10; Postprocessing SW: SEMCAD, V1.8 Build 133

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (interpolated) = 2.44 mW/g

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

Reference Value = 54.2 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 3.36 W/kg SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.48 mW/g Maximum value of SAR (measured) = 2.45 mW/g

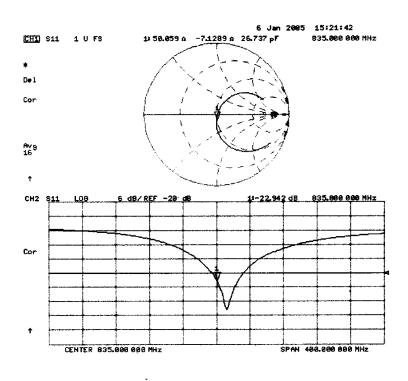


Certificate No: D835V2-446\_Jan05

Page 5 of 6

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model	•	7285	Page 16(24)
Author Data Lauren Weber	Dates of Test August 02 – August 04, 2005	Test Report No RTS-0248-0508-02	FCC ID: L6ARA	AP31GW

#### Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446\_Jan05

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Page 6 of 6

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model		7285	Page 17(24)
Author Data	Dates of Test	Test Report No	FCC ID:	
Lauren Weber	August 02 – August 04, 2005	RTS-0248-0508-02	L6ARA	P31GW



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Client RIM

Certificate No: D1900V2-545\_Jan05

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Accreditation No.: SCS 108

Dbject	D1900V2 - SN: 5	45	
Calibration procedure(s)	QA CAL-05.v6 Calibration proce	dure for dipole validation kits	
Calibration date:	January 06, 2005	i	
Condition of the calibrated item	In Tolerance		
The measurements and the unce	rtainties with confidence p	onal standards, which realize the physical units of robability are given on the following pages and are	part of the certificate.
		y facility: environment temperature (22 $\pm$ 3)°C and	l humidity < 70%.
Calibration Equipment used (M&I	E GITUGALIOF CALIDIATION)		
Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
		40 Ave 04 (METAR, No 251 00402)	Aug.05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402) 26 Oct 04 (SBEAG, No ET3-1507, Oct04)	Aug-05 Oct-05
Reference 10 dB Attenuator Reference Probe ET3DV6		10-Aug-04 (METAS, No 251-00402) 26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_May104)	Ацд-05 Oct-05 Мау-05
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4	SN: 5047.2 (10r) SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards	SN: 5047.2 (10r) SN 1507 SN 907	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_Mayl04)	Oct-05 May-05 Scheduled Check In house check: Oct-05
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A	SN: 5047.2 (10r) SN 1507 SN 907	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_Mayl04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03)	Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03	SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_Mayl04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03)	Oct-05 May-05 Scheduled Check In house check: Oct-05
Reference 20 dB Attenuator Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03 Network Analyzer HP 8753E	SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317 100698	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03) 18-Oct-01 (SPEAG, in house check Nov-04) Function	Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov 05 Signature
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03 Network Analyzer HP 8753E	SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317 100698 US37390585 S4206	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03) 18-Oct-01 (SPEAG, in house check Nov-04) Function	Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov 05 Signature
Reference 10 dB Attenuator Reference Probe ET3DV6 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SML-03	SN: 5047.2 (10r) SN 1507 SN 907 ID # MY41092317 100698 US37390585 S4206 Name	26-Oct-04 (SPEAG, No. ET3-1507_Oct04) 03-May-04 (SPEAG, No. DAE4-907_MayI04) Check Date (in house) 18-Oct-02 (SPEAG, in house check Oct-03) 27-Mar-02 (SPEAG, in house check Dec-03) 18-Oct-01 (SPEAG, in house check Nov-04) Function	Oct-05 May-05 Scheduled Check In house check: Oct-05 In house check: Dec-05 In house check: Nov 05

Certificate No: D1900V2-545\_Jan05

Page 1 of 6



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Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

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#### Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

### Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

#### Additional Documentation:

d) DASY4 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole
  positioned under the liquid filled phantom. The impedance stated is transformed from the
  measurement at the SMA connector to the feed point. The Return Loss ensures low
  reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D1900V2-545\_Jan05

Page 2 of 6

RTS RIM Testing Services	SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW			Page 19(24)
Author Data	Dates of Test	Test Report No	FCC ID:	
Lauren Weber	August 02 – August 04, 2005	RTS-0248-0508-02	L6ARA	AP31GW

#### **Measurement Conditions**

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

DASY Version	DASY4	V4.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	38.9 ± 6 %	1.45 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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 <sup>1</sup>	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	5.34 mW / g
SAR normalized	normalized to 1W	21.4 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	20.7 mW / g ± 16.5 % (k=2)

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

Certificate No: D1900V2-545\_Jan05

Page 3 of 6

#### Appendix

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω + 2.1 jΩ
Return Loss	- 31.5 dB

#### **General Antenna Parameters and Design**

Electrical Delay (one direction)	1.198 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\_Jan05

Page 4 of 6

#### DASY4 Validation Report for Head TSL

Date/Time: 01/06/05 18:30:23

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN545

Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1 Medium: HSL 1900 MHz; Medium parameters used: f = 1900 MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY4 (High Precision Assessment)

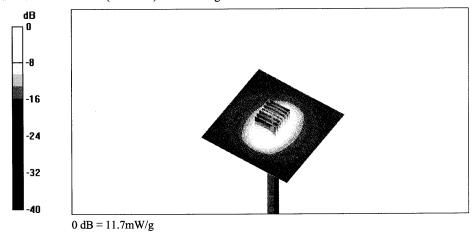
DASY4 Configuration:

- Probe: ET3DV6 SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 03.05.2004
- Phantom: Flat Phantom quarter size; Type: QD000P50AA; Serial: SN:1001;
- Measurement SW: DASY4, V4.4 Build 10; Postprocessing SW: SEMCAD, V1.8 Build 133

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (interpolated) = 11.6 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.2 V/m; Power Drift = 0.007 dB Peak SAR (extrapolated) = 18 W/kg SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.34 mW/g Maximum value of SAR (measured) = 11.7 mW/g

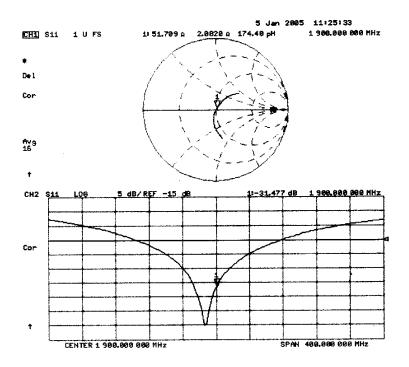


Certificate No: D1900V2-545\_Jan05

Page 5 of 6

RTS RIM Testing Services	SAR Compliance Test Rep Wireless Handheld Model	•	7285	Page 22(24)
Author Data Lauren Weber	Dates of Test         Test Report No         FCC ID:           August 02 – August 04, 2005         RTS-0248-0508-02         L6AR			AP31GW

#### Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-545\_Jan05 Page 6 of 6

RTS RIM Testing Services	5			Page 23(24)
Author Data	Dates of Test	Test Report No	FCC ID:	
Lauren Weber	August 02 – August 04, 2005	RTS-0248-0508-02	L6ARA	AP31GW

APPENDIX E: SAR SET UP PHOTOS

Berry 7285 24(24)	Document SAR Compliance Test Report for the BlackBerry 7285 Wireless Handheld Model No. RAP31GW		RTS RIM Testing Services
FCC ID:	Test Report No	Dates of Test	Author Data
2 L6ARAP31GW	RTS-0248-0508-02	er August 02 – August 04, 2005	Lauren Weber
	1		

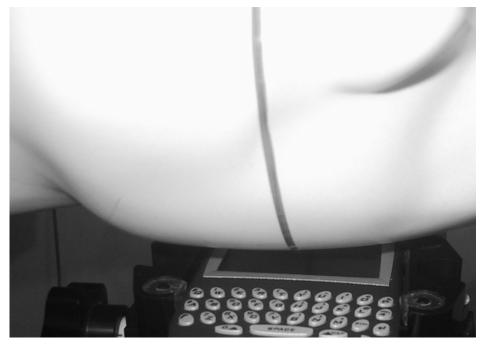


Figure E1. Tilt configuration



Figure E2. Body worn configuration, vertical foam holster