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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA

Testing Services™	Appendix D for the Black	Berry® Smartphone Mod	del RDM71UW	Page 2(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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





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Client RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: ET3-1643_Mar10

CALIBRATION CERTIFICATE Object ET3DV6 - SN:1643 QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2 Calibration procedure(s) Calibration procedure for dosimetric E-field probes March 9, 2010 Calibration date: 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%. Calibration Equipment used (M&TE critical for calibration) Primary Standards Cal Date (Certificate No.) Scheduled Calibration Power meter E4419B GB41293874 1-Apr-09 (No. 217-01030) Apr-10 Power sensor E4412A MY41495277 1-Apr-09 (No. 217-01030) Apr-10 Power sensor E4412A MY41498087 1-Apr-09 (No. 217-01030) Apr-10 Reference 3 dB Attenuator SN: S5054 (3c) 31-Mar-09 (No. 217-01026) Mar-10 Reference 20 dB Attenuator SN: S5086 (20b) 31-Mar-09 (No. 217-01028) Mar-10 Reference 30 dB Attenuator SN: S5129 (30b) 31-Mar-09 (No. 217-01027) Mar-10 Reference Probe ES3DV2 SN: 3013 30-Dec-09 (No. ES3-3013 Dec09) Dec-10 DAE4 SN: 660 29-Sep-09 (No. DAE4-660_Sep09) Sep-10 Check Date (in house) Secondary Standards ID# Scheduled Check RF generator HP 8648C US3642U01700 4-Aug-99 (in house check Oct-09) In house check: Oct-11 Network Analyzer HP 8753E US37390585 18-Oct-01 (in house check Oct-09) In house check: Oct10 Function Name Calibrated by: Laboratory Technician Approved by: Technical Manager Issued: March 10, 2010 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: ET3-1643_Mar10

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Calibration Laboratory of

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





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Glossary:

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 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., 9 = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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
- iEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide).
 NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E²-field uncertainty 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.

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Testing Services™	Appendix D for the BlackB	Berry® Smartphone Mod	lel RDM71UW	Page 4(41)
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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Probe ET3DV6

SN:1643

Manufactured: November 7, 2001 Last calibrated: March 10, 2009 Recalibrated: March 9, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1643_Mar10

Testing Services™	Appendix D for the BlackB	Berry® Smartphone Mod	lel RDM71UW	Page 5(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY - Parameters of Probe: ET3DV6 SN:1643

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) ²) ^A	1.75	2.01	1.79	± 10.1%
DCP (mV) ⁸	93.2	91.0	90.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	С	VR mV	Unc ^E (k=2)
10000	cw	0.00	×	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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%.

Certificate No: ET3-1643_Mar10

A The uncertainties of NormX,Y,Z do not affect the E-field uncertainty inside TSL (see Pages 5 and 6).

Numerical linearization parameter: uncertainty not required.

E Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

Testing Services™	Appendix D for the BlackE	Berry® Smartphone Mod	lel RDM71UW	Page 6(41)
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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY - Parameters of Probe: ET3DV6 SN:1643

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X Cor	nvFY Co	nvF Z	Alpha	Depth Unc (k=2)	_
900	±50/±100	$41.5 \pm 5\%$	0.97 ± 5%	6.01	6.01	6.01	0.42	2.35 ± 11.0%	
1810	±50/±100	$40.0 \pm 5\%$	$1.40 \pm 5\%$	4.99	4.99	4.99	0.62	2.35 ± 11.0%	
1950	±50/±100	40.0 ± 5%	1.40 ± 5%	4.74	4.74	4.74	0.79	2.10 ± 11.0%	

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY - Parameters of Probe: ET3DV6 SN:1643

Calibration Parameter Determined in Body Tissue Simulating Media

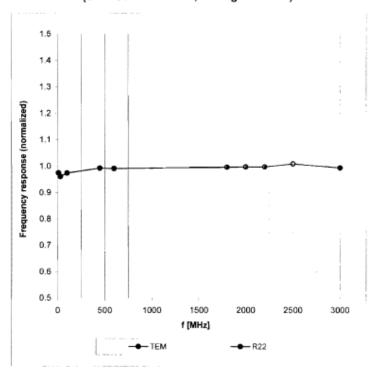
f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X Co	nvFY Co	nvF Z	Alpha	Depth Unc (k=2)	
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.93	5.93	5.93	0.33	2.77 ± 11.0%	
1810	±50/±100	53.3 ± 5%	1.52 ± 5%	4.58	4.58	4.58	0.75	2.63 ± 11.0%	
1950	±50/±100	53.3 ± 5%	1.52 ± 5%	4.54	4.54	4.54	0.99	2.20 ± 11.0%	

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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Frequency Response of E-Field

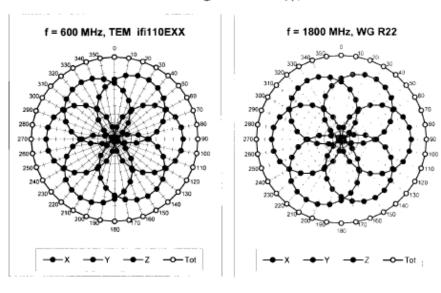
(TEM-Cell:ifi110 EXX, Waveguide: R22)

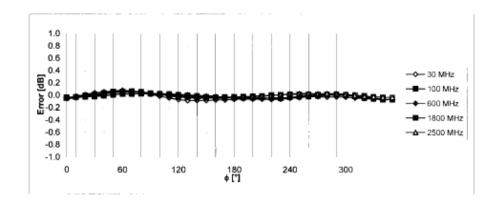


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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



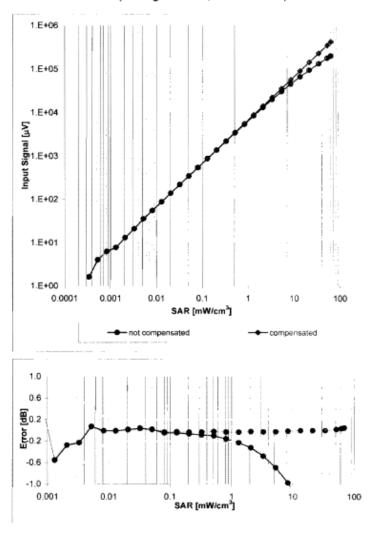


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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Dynamic Range f(SAR_{head})

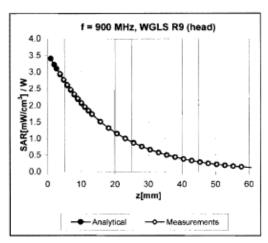
(Waveguide R22, f = 1800 MHz)

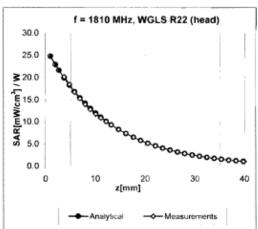


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

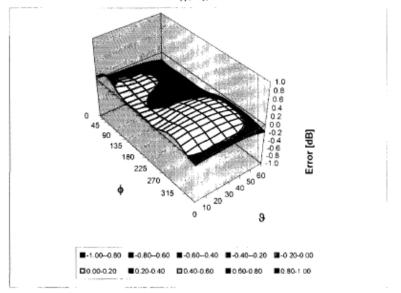
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (φ, θ), f = 900 MHz



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

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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

Testing Services™	Appendix D for the Blackl	Berry® Smartphone Mo	del RDM71UW	Page 13(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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





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'AI IRPATION	CERTIFICAT		o: ET3-1644_Nov19
ALIBRATION	CERTIFICAT		
ibye cz	ET3DV6 - SN:1	644	
plibration procedure(s)		QA CAL-23.v3 and QA CAL-25.v2 edure for dostmetric E-field probe	
albration date	November 16, 2	2010	
		ibonal standards, which replize the physical un probability are given on the following pages an	
I ce€bretions have been cond:	ucted in the closed taborat	ory facility: environment temperature (22 ± 3)*(C and humidity < 70%
alibration Equipment used (Ma	&TE cirbsal for calibration)		
	ID#	Cal Date (Certificate No.)	Scheduted Calibration
ower meter E4418B	GB41293874	1-Apr-10 (No. 217-01136)	Scheduled Calibration Apr-11
wer meter E4419B wer sensor E4412A	GB41293874 MY41495277	1-Apr-10 (No. 217-01138) 1-Apr-10 (No. 217-01138)	
rwer meter E4418B wer sensor E4412A wer sensor E4412A	GB41293874 MY41495277 MY41498087	1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136)	Apt-11
nver meter E44198 nver sensor E4412A nver sensor E4412A ference 3 dB Attenuator	GB41293874 MY41495277 MY41498087 SN: \$5054 (3c)	1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159)	Apr-11 Apr-11 Apr-11 Mar-11
we'r meter E4419B wer sensor E4412A wer sensor E4412A ference 3 dB Attenuator ference 20 dB Attenuator	GB41293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95066 (2cb)	1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161)	Apa-11 Apa-11 Apa-11 Mar-11 Mar-11
we'r meter E4419B wer sensor E4412A wer sensor E4412A ference 3 dB Attenuator ference 20 dB Attenuator ference 20 dB Attenuator	GB41293874 MY41499277 MY41498087 SN: 95054 (3c) SN: 95065 (20b) SN: 95065 (20b)	1-Apr-10 (No. 217-01138) 1-Apr-10 (No. 217-01138) 1-Apr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160)	Apa-11 Apa-11 Apa-11 Mar-11 Mar-11 Mar-11
over meter E44198 over sensor E4412A over sensor E4412A eference 3 dB Attenuator eference 20 dB Attenuator oforence 30 dB Attenuator oforence 30 dB Attenuator	GB41293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95066 (2cb)	1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 1-Apr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161)	Apa-11 Apa-11 Apa-11 Mar-11 Mar-11
ower meter E4419B ower sensor E4412A ower sensor E4412A derence 3 dB Attenuator eference 20 dB Attenuator oference 30 dB Attenuator oference 30 dB Attenuator afasence Probe E\$300/2	GB41293874 MY41499277 MY41498087 SN: 95054 (3c) SN: 95065 (2ob) SN: 95065 (3ob) SN: 95129 (3ob)	1-Apr-10 (No. 217-01138) 1-Apr-10 (No. 217-01138) 1-Apr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 30-Doc-09 (No. ES3-3013 [Doc-09]	Agr-11 Agr-11 Agr-11 Mar-11 Mar-11 Mar-11 Dec-10 Agr-11
ower meter E44198 ower sensor E4412A ower sensor E4412A ower sensor E4412A eference 3 dB Attenuator eference 20 dB Attenuator eference 20 dB Attenuator eference 30 dB Attenuator eference Probe E5307/2 AE4 econdary Standards	G841293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95054 (2cb) SN: 95129 (30b) SN: 95129 (30b) SN: 960	1-Agr-10 (No. 217-01138) 1-Agr-10 (No. 217-01138) 1-Agr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 30-Mar-10 (No. 217-01160) 30-Dac-09 (No. ES3-3013_Dec90) 20-Agr-10 (No. DAE4-660_Agr10)	Apr-11 Apr-11 Apr-11 Mar-11 Mar-11 Dec-10
ower meter E44198 ower sensor E4412A ower sensor E4412A ower sensor E4412A reference 3 dB Attenuator reference 20 dB Attenuator reference 20 dB Attenuator reference 20 dB Attenuator affisence Probe E33CV2 AE4 econdary Standards E generator MP 8648C	G841293874 MY41495277 MY41498087 SN: \$5054 (3c) SN: \$5045 (20b) SN: \$5129 (30b) SN: 3013 SN: 860	1-Agr-10 (No. 217-01138) 1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 30-Mar-10 (No. 217-01159) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01160) 30-Dec-09 (No. ES2-3013_Dec90) 20-Agr-10 (No. DAE4-660_Agr10) Check Date (in house)	Agr-11 Agr-11 Agr-11 Mar-11 Mar-11 Mar-11 Dec-10 Agr-11 Scheduled Check
ower meter E4419B ower sensor E4412A ower sensor E4412A ower sensor E4412A eference 3 dB Attenuator eference 20 dB Attenuator oforence 30 dB Attenuator aference Probe E33DV2 AE4 econdary Standards Figenerator HP 8648C attwork Analyzor HP 8783E	G841293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95065 (3c) SN: 95029 (30b) SN: 3013 SN: 860 ID# US3642U01700 US37390585	1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 30-Mar-10 (No. 217-01136) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01161) 30-Dec-09 (No. ES3-3013_Dec09) 20-Agr-10 (No. DAE4-680_Agr10) Check Date (in house) 4-Aug-69 (in house check Oct-10) Function	Agr-11 Agr-11 Agr-11 Mar-11 Mar-11 Dec-10 Agr-11 Scheduled Check In house check: Oct-11
Primary Standards Power meter E44198 Power sensor E4412A Power Standards Probe E33EV2 Power Standards Power Standa	G841293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95065 (3c) SN: 95129 (30b) SN: 3013 SN: 860 ID# US3842U01700 US37390585	1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 30-Mar-10 (No. 217-01136) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01161) 30-Dec-09 (No. ES3-3013_Dec90) 20-Agr-10 (No. DAE4-880_Agr-10) Check Date (in house) 4-Aug-69 (in house check Oct-09) 18-Osl-01 (in house check Oct-10)	Agr-11 Agr-11 Agr-11 Mar-11 Mar-11 Dec-10 Agr-11 Scheduled Check In house check: Det-11 In house check: Det-11
ower meter E4419B ower sensor E4412A ower sensor E4412A ower sensor E4412A deference 3 dB Attenuator deference 20 dB Attenuator deference 30 dB Attenuator deference Probe E33DV2 dAE4 econdary Standards F generator HP 8648C etwork Analyzor HP 8763E	G841293874 MY41495277 MY41498087 SN: 95054 (3c) SN: 95065 (3c) SN: 95029 (30b) SN: 3013 SN: 860 ID# US3642U01700 US37390585	1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 1-Agr-10 (No. 217-01136) 30-Mar-10 (No. 217-01136) 30-Mar-10 (No. 217-01161) 30-Mar-10 (No. 217-01161) 30-Dec-09 (No. ES3-3013_Dec09) 20-Agr-10 (No. DAE4-680_Agr10) Check Date (in house) 4-Aug-69 (in house check Oct-10) Function	Agr-11 Agr-11 Agr-11 Mar-11 Mar-11 Dec-10 Agr-11 Scheduled Check In house check: Det-11 In house check: Det-11

Testing Services™	Appendix D for the Black	Berry® Smartphone Moo	lel RDM71UW	Page 14(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Calibration Laboratory of





Schweizertscher Kalibriardianat

Service sulsee d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 108

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

Accredited by the Swiss Accreditation Service (5AS). The Swiss Accreditation Service is one of the signetories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL tissue simulating liquid NORMx,y,z sensitivity in free space. sensitivity in TSL / NORMx,y,z ConvE DCP diade compression point

CF crest factor (1/duty_cycle) of the RF signal A, B, C modulation dependent linearization parameters.

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., 3 = 0 is normal to probe axis.

Calibration is Performed According to the Following Standards:

- 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 82299-1, "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 2006

Methods Applied and Interpretation of Parameters:

- NORMX, y, z: Assessed for E-field polarization $\theta = 0$ (f ≤ 900 MHz in TEM-cell: f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E2-field uncertainty inside TSL (see below ConvF).
- NORM(f)x, y, z = NORMx, y, z * frequency response (see Frequency Response Chart). This linearization isimplemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConyF.
- 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; 8x, y, z; 0x, 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 $f \le 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $t \ge 800$ 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 \pm 50 MHz to \pm 100.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antennal
- 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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Testing Services™	Appendix D for the BlackB	Berry® Smartphone Mod	lel RDM71UW	Page 15(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Probe ET3DV6

SN:1644

Manufactured: November 7, 2001
Last calibrated: November 11, 2009
Recalibrated: November 16, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: €T3-1644_Nov10

Testing Services™	Appendix D for the BlackB	Berry® Smartphone Mod	lel RDM71UW	Page 16(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY/EASY - Parameters of Probe: ET3DV6 SN:1644

Basic Calibration Parameters

	Sensor X	Sensor Y	SensorZ	Unc (k=2)
Norm (µV/(V/m) ²) ^A	1.83	1.95	2.01	± 10.1%
DCP (mV) ⁵	97.9	97.9	96.6	

Modulation Calibration Parameters

סוט	Communication System Name	PAR		A dB	B dBuV	С	VR mV	(ine [±] (<u>k</u> =2)
10000	CM	0.00	x	0.00	0.00	1.00	143.5	± 3.4 %
			Y	0.00	0.00	1.00	146.8	
			Z	0.00	0.00	1.00	148.4	

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%.

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 $^{^{\}circ}$ The uncontainties of NormX Y 2 do not effect the E^{2} field uncontainty inside TSL (see Pages 6 and 6)

 $^{^{\}rm i}$ Numerical innearization parameter, uncertainty not required.

^{*} Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the equare of the field value.

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY/EASY - Parameters of Probe: ET3DV6 SN:1644

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ⁵	Permittivity	Conductivity	ConvEX Cor	nyF Y Co	nvF Z	Alpha	Depth Unc (k=2)
76D	$\pm 50/\pm 100$	41.9 ± 5%	0.89 ± 5%	6.54	6.54	6.54	0.31	3.05 ± 11.0%
900	\pm 50 / \pm 100	41.5 ± 5%	$0.97 \pm 5\%$	6.00	6.00	6.00	0.27	3.46 ± 11.0%
1810	$\pm 50 / \pm 100$	$40.0 \pm 5\%$	1 40 ± 5%	5.09	5.09	5.00	0.40	2.50 ± 11.0%
2450	±50/±100	39.2 ± 5%	$1.80\pm5\%$	4.42	4.42	4.42	0.99	1.27 ± 11.0%

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 improved frequency band.

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

DASY/EASY - Parameters of Probe: ET3DV6 SN:1644

Calibration Parameter Determined in Body Tissue Simulating Media

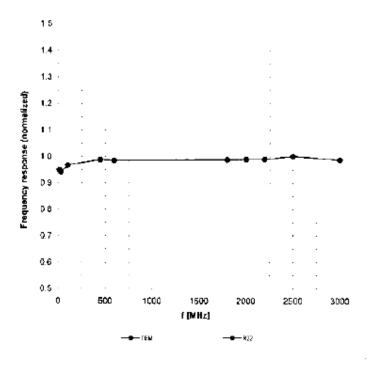
f (MHz)	Validity (MHz) ^c	Permittivity	Conductivity	ConvF X Co	nvFY Co	nvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	55 5 ± 5%	$0.96 \pm 5\%$	6.14	8.14	6.14	0.31	3.06 ± 11.0%
900	\pm 50 (\pm 100	55 0 ± 5%	$1.05\pm5\%$	5.93	5.93	5 93	0.36	2.71 ± 11.0%
1810	± 50 / ± 100	53 3 ± 5%	$1.52 \pm 5\%$	4.59	4.59	4 59	0 32	2.60 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	$1.95\pm5\%$	4.05	4.05	4 05	0.99	1.23 ± 11.0%

The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the ASS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Testing Services™	Appendix D for the Black	Berry® Smartphone Mod	lel RDM71UW	Page 19(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Frequency Response of E-Field

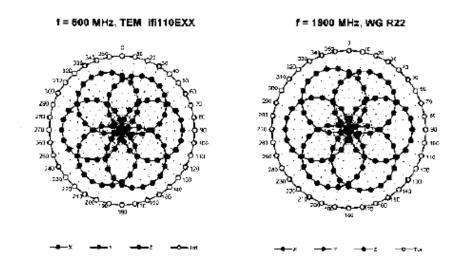
(TEM-Cell:ifi110 EXX, Waveguide: R22)

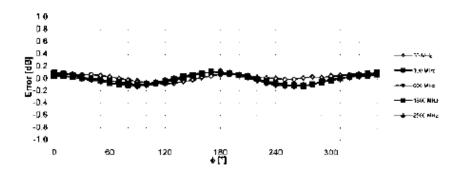


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Receiving Pattern (ϕ), ϑ = 0°

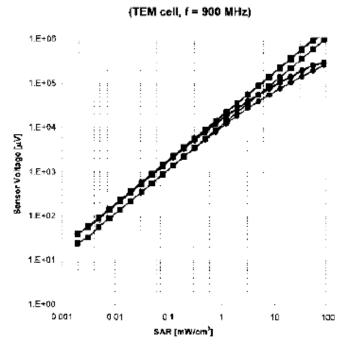


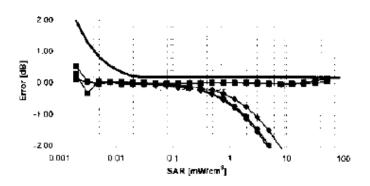


Uncertainty of Axial isotropy Assessment: ± 0.5% (k=2)

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Dynamic Range $f(SAR_{head})$

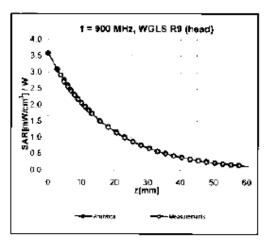


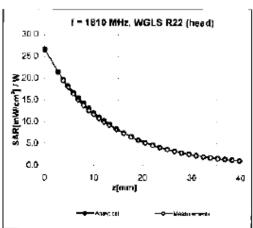


Uncertainty of Linearity Assessment: ± 0.6% (k-2)

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

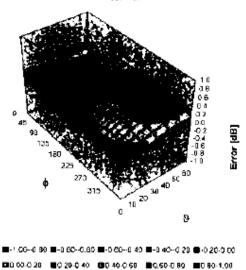
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (4, 9), f = 900 MHz



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

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Testing Services™	Appendix D for the BlackE	Berry® Smartphone Mod	lel RDM71UW	Page 23(41)
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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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 nsm
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	3.7 mm

Testing Services™			Page 24(41)	
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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





Schweizerischer Kalibrierdienst S Service suisse d'étalonnage C 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

Certificate No: D835V2-446_Jan09 RTS (RIM Testing Services) CALIBRATION CERTIFICATE D835V2 - SN: 446 Object QA CAL-05.v7 Calibration procedure(s) Calibration procedure for dipole validation kits January 05, 2009 Calibration date: In Tolerance Condition of the calibrated item 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%. Calibration Equipment used (M&TE critical for calibration) Primary Standards ID# Cal Date (Certificate No.) Scheduled Calibration Power meter EPM-442A GB37480704 08-Oct-08 (No. 217-00898) Oct-09 Power sensor HP 8481A US37292783 08-Oct-08 (No. 217-00898) Oct-09 Reference 20 dB Attenuator SN: 5086 (20g) 01-Jul-08 (No. 217-00864) Jul-09 Type-N mismatch combination SN: 5047.2 / 06327 01-Jul-08 (No. 217-00867) Jul-09 Reference Probe ES3DV2 SN: 3025 28-Apr-08 (No. ES3-3025_Apr08) Apr-09 DAE4 SN: 601 14-Mar-08 (No. DAE4-601_Mar08) Mar-09 Secondary Standards ID# Scheduled Check Check Date (in house) Power sensor HP 8481A MY41092317 18-Oct-02 (in house check Oct-07) In house check: Oct-09 RF generator R&S SMT-06 100005 4-Aug-99 (in house check Oct-07) In house check: Oct-09 Network Analyzer HP 8753E US37390585 S4206 18-Oct-01 (in house check Oct-08) In house check: Oct-09 Function Name Calibrated by: Jeton Kastrati Laboratory Technician Approved by: Katia Pokovic Technical Manager Issued: January 7, 2009 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: D835V2-446_Jan09

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Testing Services™	Appendix D for the BlackB	serry® Smartphone Mod	el RDM71UW	Page 25(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011 RTS-3640-1102-04 L6ARDM70UW		2503A-RDM70UW	

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





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Accreditation No.: SCS 108

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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
- EC 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.

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Testing Services™	Appendix D for the BlackB	serry® Smartphone Mod	lel RDM71UW	Page 26(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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 ³ (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 cm3 (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)

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

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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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Testing Services™	Appendix D for the BlackE	Berry® Smartphone Mod	lel RDM71UW	Page 28(41)
Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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; $\varepsilon_c = 41.1$; $\rho = 1000$ kg/m³

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,

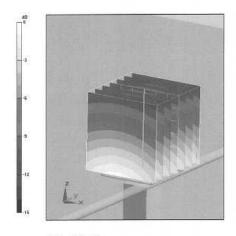
dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 3.54 W/kg

SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.58 mW/g

Maximum value of SAR (measured) = 2.7 mW/g



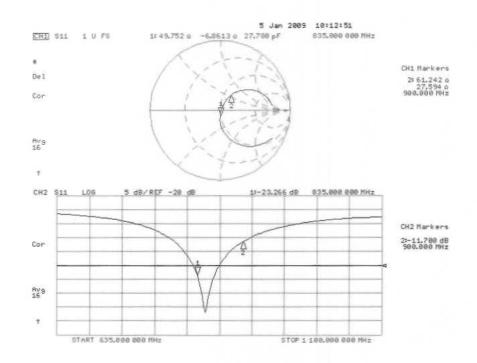
 $0~\mathrm{dB} = 2.7 \mathrm{mW/g}$

Certificate No: D835V2-446_Jan09

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Impedance Measurement Plot for Head TSL



Certificate No: D835V2-446_Jan09 Page 6 of 6



Calibration Laboratory of Schmid & Partner

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Client

RTS (RIM Testing Services)

Certificate No: D1900V2-545-Jan09

Accreditation No.: SCS 108

CALIBRATION (CERTIFICATE		
Object	D1900V2 - SN: 5	45	
Calibration procedure(s)	QA CAL-05.v7 Calibration proce	dure for dipole validation kits	
Calibration date:	January 06, 2009		
Condition of the calibrated item	In Tolerance		00 7 3 Km 0 1
		robability are given on the following pages and γ facility: environment temperature (22 \pm 3)°C γ	
Calibration Equipment used (M&	TE critical for calibration)		
Primary Standards	ID#	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Primary Standards Power meter EPM-442A	ID # GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A	ID # GB37480704 US37292783	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898)	Oct-09 Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator	ID # GB37480704 US37292783 SN: 5086 (20g)	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864)	Oct-09 Oct-09 Jul-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination	ID# GB37480704 US37292783 SN: 5085 (20g) SN: 5047.2 / 06327	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867)	Oct-09 Oct-09 Jul-09 Jul-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2	ID # GB37480704 US37292783 SN: 5086 (20g)	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864)	Oct-09 Oct-09 Jul-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2 DAE4	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3025 SN: 601	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08)	Oct-09 Oct-09 Jul-09 Jul-09 Apr-09 Mar-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES30V2 DAE4 Secondary Standards	ID # GB37480704 US37292763 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3025 SN: 601	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3025 SN: 601	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house) 18-Oct-02 (in house check Oct-07)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check In house check: Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB37480704 US37292763 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3025 SN: 601	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check
Calibration Equipment used (M& Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Typel-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3025 SN: 601 ID # MY41092317 100005	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house) 18-Oct-02 (in house check Oct-07) 4-Aug-99 (in house check Oct-07)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check In house check: Oct-09 In house check: Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Typel-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3025 SN: 601 ID # MY41092317 100005	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house) 18-Oct-02 (in house check Oct-07) 4-Aug-99 (in house check Oct-07)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check In house check: Oct-09 In house check: Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3025 SN: 601 ID # MY41082317 100005 US37390585 S4206	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house) 18-Oct-02 (in house check Oct-07) 4-Aug-99 (in house check Oct-07) 18-Oct-01 (in house check Oct-08)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check In house check: Oct-09 In house check: Oct-09 In house check: Oct-09
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV2 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB37480704 US37292783 SN: 5086 (20g) SN: 5047 2 / 06327 SN: 3025 SN: 601 ID # MY41092317 100005 US37390585 S4206	08-Oct-08 (No. 217-00898) 08-Oct-08 (No. 217-00898) 01-Jul-08 (No. 217-00864) 01-Jul-08 (No. 217-00867) 28-Apr-08 (No. ES3-3025_Apr08) 14-Mar-08 (No. DAE4-601_Mar08) Check Date (in house) 18-Oct-02 (in house check Oct-07) 4-Aug-99 (in house check Oct-07) 18-Oct-01 (in house check Oct-08)	Oct-09 Oct-09 Jul-09 Jul-09 Jul-09 Apr-09 Mar-09 Scheduled Check In house check: Oct-09 In house check: Oct-09 In house check: Oct-09

Certificate No: D1900V2-545_Jan09

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Calibration Laboratory of

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





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Accreditation No.1 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 celibration 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 nominal SAR result.

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Measurement Conditions

ofiguration, 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	-	mpan.

SAR result with Head TSL

SAR averaged over 1 cm ³ (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 ³ (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 1	normalized to 1W	20.8 mW / g ± 16.5 % (k=2)

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¹ 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	49.9 Ω + 1.9 jΩ	
Return Loss	- 34,4 dB	

General Antenna Parameters and Design

Electrical Delay (one direction) 1.197 ns	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

Testing Services™	Appendix D for the Blackl	Berry® Smartphone Moo	lel RDM71UW	Page 34(41)
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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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/m³

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)

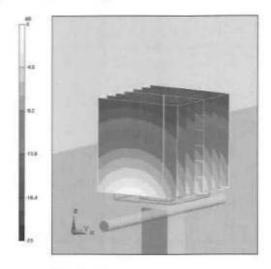
(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

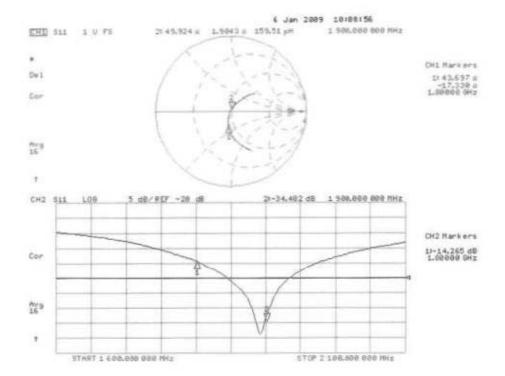
Maximum value of SAR (measured) = 12 mW/g



0 dB = 12mW/g

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Impedance Measurement Plot for Head TSL



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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

Calibration Laboratory of Schmid & Partner Engineering AG





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Zeughausstrasse 43, 8004 Zurich, Switzerland

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RTS (RIM Testing Services) Client

Certificate No: D2450V2-747_Nov09

Accreditation No.: SCS 108

CALIBRATION CERTIFICAT D2450V2 - SN: 747 Object QA CAL-05.V7 Calibration procedure(s) Calibration procedure for dipole validation kits Calibration date: November 11, 2009 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%. Calibration Equipment used (M&TE critical for calibration) Primary Standards Cal Date (Certificate No.) Scheduled Calibration GB37480704 Power meter EPM-442A 06-Oct-09 (No. 217-01086) Oct-10 Power sensor HP 8481A US37292783 06-Oct-09 (No. 217-01086) Oct-10 Reference 20 dB Attenuator SN: 5086 (20g) 31-Mar-09 (No. 217-01025) Mar-10 SN: 5047.2 / 06327 Type-N mismatch combination 31-Mar-09 (No. 217-01029) Mar-10 Reference Probe ES3DV3 SN: 3205 26-Jun-09 (No. ES3-3205_Jun09) Jun-10 DAE4 SN: 601 07-Mar-09 (No. DAE4-601_Mar09) Mar-10 Secondary Standards ID# Check Date (in house) Scheduled Check Power sensor HP 8481A MY41092317 18-Oct-02 (in house check Oct-09) In house check: Oct-11 RF generator R&S SMT-06 100005 4-Aug-99 (in house check Oct-09) In house check: Oct-11 Network Analyzer HP 8753E US37390585 S4206 18-Oct-01 (in house check Oct-09) In house check: Oct-10 **Function** Signature Name Calibrated by: Approved by: Issued: November 16, 2009 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

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Calibration Laboratory of

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





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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.

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Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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 mho/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 cm3 (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)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.23 mW / g
SAR normalized	normalized to 1W	24.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.9 mW /g ± 16.5 % (k=2)

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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

٠		
ı	Electrical Delay (one direction)	1.161 ns
-	Liberital Delay (one all estion)	1.101110

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

Certificate No: D2450V2-747_Nov09

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Author Data	Dates of Test	Test Report No	FCC ID:	IC ID
Hang Wang	Jan 11 – Feb 15, 2011	RTS-3640-1102-04	L6ARDM70UW	2503A-RDM70UW

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; $\sigma = 1.79 \text{ mho/m}$; $\varepsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

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:

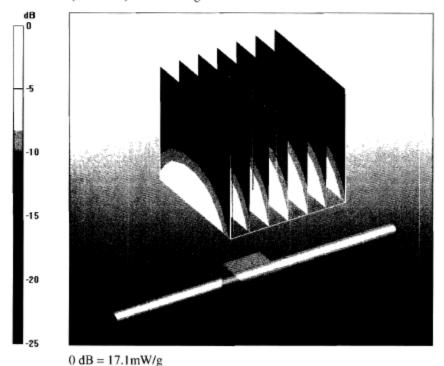
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference 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



Certificate No: D2450V2-747_Nov09

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Impedance Measurement Plot for Head TSL

