| Testin Service | Appendix D for the Black Report | Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR | | | |
|-------------------|---------------------------------|---|------------|---------------|--|
| Author Data | Dates of Test | Test Report No | FCC ID: | IC | |
| Andrew Becker | Mar 04 – May 13, 2013 | RTS-6036-1305-12 | L6ARFT80UW | 2503A-RFT80UW | |

APPENDIX D: PROBE & DIPOLE CALIBRATION DATA



Document

Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR Report

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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID:

L6ARFT80UW

2503A-RFT80UW

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





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

Accredited by the Swiss Accreditation Service (SAS)

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Multilateral Agreement for the recognition of calibration certificates

Client RTS (RIM Testing Services)

Certificate No: ES3-3225_Jan13

Accreditation No.: SCS 108

C

CALIBRATION CERTIFICATE

Object

ES3DV3 - SN:3225

Calibration procedure(s)

QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4 Calibration procedure for dosimetric E-field probes

Calibration date:

January 10, 2013

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 E4419B | GB41293874 | 29-Mar-12 (No. 217-01508) | Apr-13 |
| Power sensor E4412A | MY41498087 | 29-Mar-12 (No. 217-01508) | Apr-13 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 27-Mar-12 (No. 217-01531) | Apr-13 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 27-Mar-12 (No. 217-01529) | Apr-13 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 27-Mar-12 (No. 217-01532) | Apr-13 |
| Reference Probe ES3DV2 | SN: 3013 | 28-Dec-12 (No. ES3-3013_Dec12) | Dec-13 |
| DAE4 | SN: 660 | 20-Jun-12 (No. DAE4-660_Jun12) | Jun-13 |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Apr-11) | In house check: Apr-13 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

Calibrated by:

| Deton Kastrati | Laboratory Technician | Laboratory Technici

(E)

Certificate No: ES3-3225_Jan13

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Author Data Andrew Becker Dates of Test

Mar 04 – May 13, 2013

Test Report No

RTS-6036-1305-12

L6ARFT80UW

FCC ID:

2503A-RFT80UW

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





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Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

NORMx,y,z ConvF

tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx,y,z diode compression point

CF A, B, C, D

DCP

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization o

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:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement
- Techniques", December 2003
 b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORMx, y, z: Assessed for E-field polarization $\vartheta = 0$ (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 affect 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.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D 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
- 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: | ES3-3225 | Jan13 |
|--|-------------|-----|----------|-------|
|--|-------------|-----|----------|-------|



ES3DV3 - SN:3225

January 10, 2013

Probe ES3DV3

SN:3225

Manufactured: Calibrated:

September 1, 2009 January 10, 2013

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

Certificate No: ES3-3225_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3225

Basic Calibration Parameters

| Source - announce - Edwinson - France | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|--|----------|----------|----------|-----------|
| Norm (µV/(V/m) ²) ^A | 1.29 | 1.19 | 1.31 | ± 10.1 % |
| DCP (mV) ⁸ | 100.5 | 101.5 | 99.9 | |

Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | С | D dB | VR mV | Unc ^E (k=2) |
|------|---------------------------|---|---------|------------|-----|---------|----------|---------------------------|
| 0 CW | CW | X | (0.0 | 0.0 | 1.0 | 0.00 | 157.5 | ±2.7 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 158.4 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 165.9 | to brother a |

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: ES3-3225_Jan13

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The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

Numerical linearization parameter: uncertainty not required.

Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the



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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3225

Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) ^C | Relative Permittivity ^F | Conductivity (S/m) ^F | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|---------------------------------------|------------------------------------|---------|---------|---------|-------|---------------|----------------|
| 750 | 41.9 | 0.89 | 6.56 | 6.56 | 6.56 | 0.42 | 1.54 | ± 12.0 % |
| 900 | 41.5 | 0.97 | 6.19 | 6.19 | 6.19 | 0.43 | 1.52 | ± 12.0 % |
| 1810 | 40.0 | 1.40 | 5.35 | 5.35 | 5.35 | 0.63 | 1.39 | ± 12.0 % |
| 1950 | 40.0 | 1.40 | 5.09 | 5.09 | 5.09 | 0.80 | 1.23 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 4.65 | 4.65 | 4.65 | 0.61 | 1.63 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 4.43 | 4.43 | 4.43 | 0.80 | 1.32 | ± 12.0 % |

 $^{^{}G}$ Frequency validity of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: ES3-3225_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3225

Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) ^C | Relative Permittivity F | Conductivity (S/m) ^F | ConvF X | ConvF Y | ConvF Z | Alpha | Depth (mm) | Unct. (k=2) |
|----------------------|----------------------------|------------------------------------|---------|---------|---------|-------|---------------|----------------|
| 750 | 55.5 | 0.96 | 6.27 | 6.27 | 6.27 | 0.48 | 1.51 | ± 12.0 % |
| 900 | 55.0 | 1.05 | 6.12 | 6.12 | 6.12 | 0.73 | 1.25 | ± 12.0 % |
| 1810 | 53.3 | 1.52 | 5.04 | 5.04 | 5.04 | 0.57 | 1.47 | ± 12.0 % |
| 1950 | 53.3 | 1.52 | 4.94 | 4.94 | 4.94 | 0.58 | 1.50 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 4.35 | 4.35 | 4.35 | 0.70 | 1.16 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 4.11 | 4.11 | 4.11 | 0.67 | 0.99 | ± 12.0 % |

Certificate No: ES3-3225_Jan13 Page 6 of 11

^C Frequency validity of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No RTS-6036-1305-12

FCC ID: L6ARFT80UW

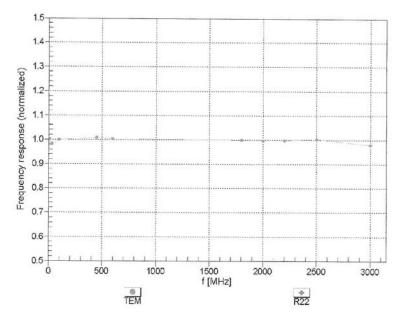
2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

Frequency Response of E-Field

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



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

Certificate No: ES3-3225_Jan13

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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID:

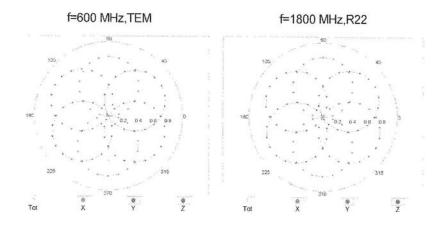
L6ARFT80UW

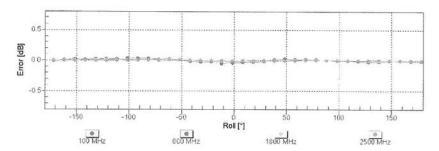
2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

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





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

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Andrew Becker

Dates of Test

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Test Report No **RTS-6036-1305-12**

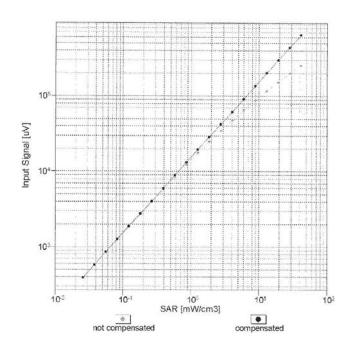
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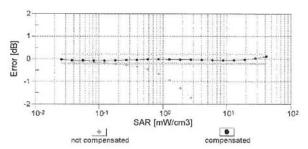
2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

Dynamic Range f(SAR_{head}) (TEM cell, f = 900 MHz)





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

Certificate No: ES3-3225_Jan13

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| Document Control of the Control of t |
|--|
| Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR |
| Report |

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12

L6ARFT80UW

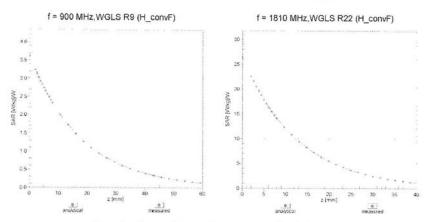
FCC ID:

2503A-RFT80UW

ES3DV3- SN:3225

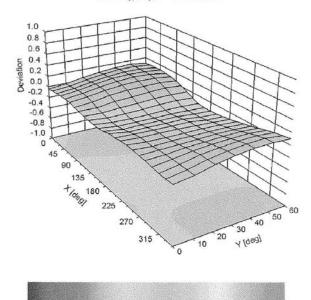
January 10, 2013

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ) , f = 900 MHz



Certificate No: ES3-3225_Jan13

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

0.2 0.4 0.6 0.8

-1.0 -0.8 -0.6 -0.4 -0.2 0.0



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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID: L6ARFT80UW

2503A-RFT80UW

ES3DV3-SN:3225

January 10, 2013

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3225

Other Probe Parameters

| Sensor Arrangement | Triangular |
|---|------------|
| Connector Angle (°) | 8.3 |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 10 mm |
| Tip Length | 10 mm |
| Tip Diameter | 4 mm |
| Probe Tip to Sensor X Calibration Point | 2 mm |
| Probe Tip to Sensor Y Calibration Point | 2 mm |
| Probe Tip to Sensor Z Calibration Point | 2 mm |
| Recommended Measurement Distance from Surface | 3 mm |

Certificate No: ES3-3225_Jan13

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Author Data **Andrew Becker** Dates of Test

Mar 04 - May 13, 2013

Test Report No RTS-6036-1305-12 FCC ID:

L6ARFT80UW

2503A-RFT80UW

Calibration Laboratory of

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





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di tareture

Swiss Calibration Service

Issued: April 7, 2011

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signetories to the EA Multilateral Agreement for the recognition of celibration certificates

RTS (RIM Testing Services) Client

Accreditation No.: SCS 108

Cartificate No: D835V2-4d043_Apr11

CALIBRATION CERTIFICATE

D835V2 - SN: 4d043 Object

Calibration procedure(s) **QA CAL-05.v8**

Calibration procedure for dipole validation kits

Calibration date: April 07, 2011

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 cartificate.

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 | 10 # | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A | GB37480704 | 06-Oct-10 (No. 217-01266) | Oct-11 |
| Power sensor HP 8481A | US37292783 | 06-Oct-10 (No. 217-01266) | Oct-11 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 29-Mar-11 (No. 217-01368) | Apr-12 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371) | Apr-12 |
| Reference Probe ES3DV3 | SN: 3205 | 30-Apr-10 (No. ES3-3205_Apr10) | Apr-11 |
| DAE4 | SN: 601 | 10-Jun-10 (No. DAE4-601_Jun10) | Jun-11 |
| 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-19) | In house check: Oct-11 |
| | Name | Function | Signature . 77 |
| Calibrated by: | Jeton Kastreti | Laboratory Technician | - 1- 1/c |
| Approved by: | Katja Pokovic | Technical Manager | 1 and the |

This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: DB35V2-4d043_Apr11



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Author Data Andrew Becker Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12

L6ARFT80UW

FCC ID:

2503A-RFT80UW

Calibration Laboratory of

Schmid & Partner **Engineering AG** Zeughausstresse 43, 8004 Zurich, Switzerland





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Swiss Calibration Service

Accreditation No.: SCS 106

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)". February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

| Certificate No: D835V2-4d043_Apr11 | Page 2 of 6 | |
|------------------------------------|-------------|--|



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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID: L6ARFT80UW

2503A-RFT80UW

Measurement Conditions

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

| DASY Version | DASY5 | V52.6.2 |
|------------------------------|---------------------------|---------------------------------------|
| 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 | A A A A A A A A A A A A A A A A A A A |
| Frequency | 835 MHz ± 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied

| * | Temperature | Permittivity | Conductivity |
|----------------------------------|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 41.5 | 0.90 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 40.6 ± 6 % | 0.88 mho/m ± 6 % |
| Head TSL temperature during test | (22.0 ± 0.2) °C | ac ever or | |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|-----------------------------------|
| SAR measured | 250 mW input power | 2.33 mW / g |
| SAR normalized | normalized to 1W | 9:32 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | 9.43 m W /g ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | , , , , , , , , , , , , , , , , , , , |
|---|--------------------|---------------------------------------|
| SAR measured | 250 mW input power | 1.52 mW / g |
| SAR normalized | normalized to 1W | 6.08 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | 6.14 mW /g ± 16.5 % (k=2) |

Certificate No: D835V2-4d043_Apr11



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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Appendix

Antenna Parameters with Head TSL

| Impedance, transformed to feed point | 52.9 Ω - 3.4 jΩ |
|--------------------------------------|-----------------|
| Return Loss | - 27.2 dB |

General Antenna Parameters and Design

| ŧ | | × | |
|---|----------------------------------|----------|---|
| Ì | Electrical Delay (one direction) | 1.391 ns | l |
| | | | |

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.

Design Modification by End User

The dipole has been modified with Tefton Rings (TR) placed within identified markings close to the end of each dipole arm. Calibration has been performed with TR attached to the dipole.

Additional EUT Data

| Manufactured by | SPEAG |
|-----------------|----------------|
| Малиfactured on | April 07, 2006 |

Certificate No: D835V2-4d043_Apr11

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

DASY5 Validation Report for Head TSL

Date/Time: 07.04.2011 09:28:21

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d043

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL900

Medium parameters used: f = 835 MHz; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 10.06.2010

Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001

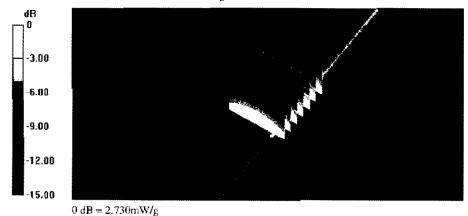
Measurement SW: DASY52, V52.6.2 Build (424)

Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Pin=250 mW /d=15mm/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 57.201 V/m; Power Drift = 0.07 dB Peak SAR (extrapolated) = 3.504 W/kg

SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/gMaximum value of SAR (measured) = 2.730 mW/g

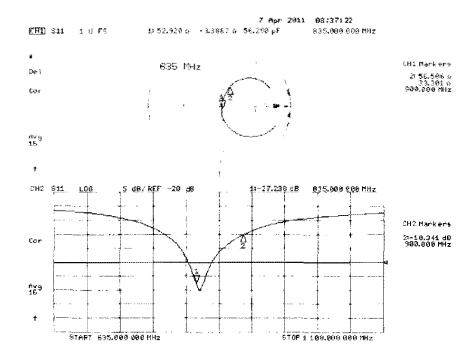


Certificate No: D835V2-4d043_Apr11

Page 5 of 6

| Testing Service | Appendix D for the BlackB Report | serry® Smartphone Mo | odel RFT81UW SAR | Page 18(43) |
|--------------------|----------------------------------|----------------------|------------------|--------------------|
| Author Data | Dates of Test | Test Report No | FCC ID: | IC |
| Andrew Becker | Mar 04 – May 13, 2013 | RTS-6036-1305-12 | L6ARFT80UW | 2503A-RFT80UW |

Impedance Measurement Plot for Head TSL





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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

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

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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1800V2-2d020 Jan13

| Object | D1800V2 - SN: 2 | d020 | |
|---|---|---|---|
| Calibration procedure(s) | QA CAL-05.v9 Calibration proce | dure for dipole validation kits abo | ove 700 MHz |
| Calibration date: | January 09, 2013 | The second second second second second | |
| The measurements and the unce | rtainties with confidence p | conal standards, which realize the physical ur robability are given on the following pages ar ry facility: environment temperature $(22 \pm 3)^\circ$ | nd are part of the certificate. |
| Calibration Equipment used (M& | TE critical for calibration) | | |
| | TE critical for calibration) | Cal Date (Certificate No.) | Scheduled Calibration |
| Primary Standards | | Cal Date (Certificate No.) 01-Nov-12 (No. 217-01640) | Scheduled Calibration Oct-13 |
| Primary Standards Power meter EPM-442A | ID# | | |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A | ID # GB37480704 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator | ID # GB37480704 US37292783 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) | Oct-13 Oct-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination | ID # GB37480704 US37292783 SN: 5058 (20k) | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) | Oct-13 Oct-13 Apr-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) | Oct-13 Oct-13 Apr-13 Apr-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 |
| Calibration Equipment used (M& Primary Standards Prower meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 |
| Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Secondary Standards Power sensor HP 8481A RF generator R&S SMT-06 | ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.3 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 | 01-Nov-12 (No. 217-01640) 01-Nov-12 (No. 217-01640) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 28-Dec-12 (No. ES3-3205_Dec12) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12) | Oct-13 Oct-13 Apr-13 Apr-13 Dec-13 Jun-13 Scheduled Check In house check: Oct-13 In house check: Oct-13 |

Certificate No: D1800V2-2d020_Jan13

Page 1 of 6

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



 $\begin{array}{c|c} SAR & 20(43) \end{array}$

Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No RTS-6036-1305-12

L6ARFT80UW

FCC ID:

2503A-RFT80UW

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





S Schweizerischer Kalibrierdienst
Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL

tissue simulating liquid

ConvF N/A sensitivity in TSL / NORM x,y,z 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.

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: D1800V2-2d020_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013

Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Measurement Conditions

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

| DASY Version | DASY5 | V52.8.4 |
|------------------------------|------------------------|-------------|
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | 7-1-1-1 |
| Frequency | 1800 MHz ± 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 40.0 | 1.40 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 38.9 ± 6 % | 1.38 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | | |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 9.61 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 38.5 W/kg ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 5.06 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 20.3 W/kg ± 16.5 % (k=2) |

Certificate No: D1800V2-2d020_Jan13



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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Appendix

Antenna Parameters with Head TSL

| Impedance, transformed to feed point | 46.2 Ω - 8.3 jΩ | |
|--------------------------------------|-----------------|--|
| Return Loss | - 20.5 dB | |

General Antenna Parameters and Design

| Electrical Delay (one direction) | 1.216 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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 | 101 |
|-----------------|--------------------|---------|
| Manufactured on | September 07, 2001 | -515000 |

Certificate No: D1800V2-2d020_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

DASY5 Validation Report for Head TSL

Date: 09.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1800 MHz

Medium parameters used: f = 1800 MHz; $\sigma = 1.38 \text{ S/m}$; $\varepsilon_r = 38.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

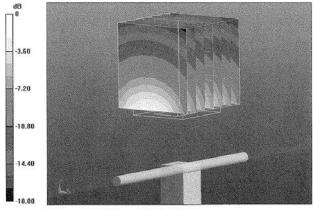
- Probe: ES3DV3 SN3205; ConvF(5.04, 5.04, 5.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 95.870 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 9.61 W/kg; SAR(10 g) = 5.06 W/kg

Maximum value of SAR (measured) = 11.8 W/kg



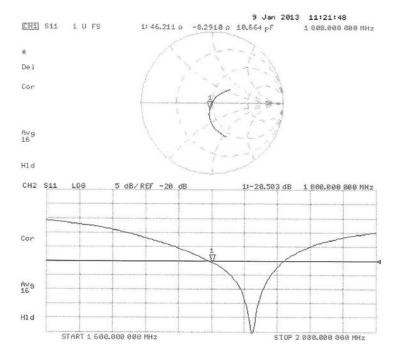
0 dB = 11.8 W/kg = 10.72 dBW/kg

Certificate No: D1800V2-2d020_Jan13

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Impedance Measurement Plot for Head TSL





Documen

Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR Report

Page **25(43)**

Author Data
Andrew Becker

Dates of Test

Mar 04 - May 13, 2013

Test Report No

RTS-6036-1305-12

L6ARFT80UW

FCC ID:

2503A-RFT80UW

Calibration Laboratory of Schmid & Partner

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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

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Client RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1900V2-5d075_Apr11

CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d075

Calibration procedure(s) QA CAL-05.v8

Calibration procedure for dipole validation kits

Calibration date: April 5, 2011

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 catibration)

| Primary Standards | ID# | Cal Date (Certificate No.) | Scheduled Calibration |
|-----------------------------|--------------------|-----------------------------------|------------------------|
| Power meter EPM-442A | GB37480704 | 06-Oct-10 (No. 217-01266) | Oct-11 |
| Power sensor HP 8481A | US37292783 | 06-Oct-10 (No. 217-01286) | Oct-11 |
| Perence 20 dB Attenuator | SN: 5086 (20g) | 29-Mar-11 (No. 217-01368) | Apr-12 |
| Type-N mismatch combination | SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371) | Apr-12 |
| Reference Probe ES3DV3 | SN: 3205 | 30-Apr-10 (No. ES3-3205_Apr10) | Apr-11 |
| DAE4 | SN: 601 | 10-Jun-10 (No. DAE4-601_Jun10) | Jun-11 |
| Secondary Standards | ID# | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41092317 | 16-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-10) | In house check: Oci-11 |
| | Name | Function | Signature |
| Calibrated by: | Mike Melli | Laboratory Technician | Titelli |

Approved by: Katja Pokovic Technical Manage

Issued: April 8, 2011

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Certificate No: D1900V2-5d075_Apr11

Page 1 of 6



Page

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Author Data Andrew Becker Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Calibration Laboratory of

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





Schweizerischer Kellbrierdienst 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 Multileteral Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

ConvF N/A

sensitivity in TSL / NORM x,y,z 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
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

| Certificate No: D1900V2-5d075, April 1 | Page 2 of 6 | |
|--|-------------|--|



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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID: L6ARFT80UW

2503A-RFT80UW

Measurement Conditions

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

| DASY Version | DASY5 | V52.6.2 |
|------------------------------|---------------------------|-------------|
| 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 mha/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 39.8 ± 6 % | 1.41 mho/m ± 6 % |
| Head TSL temperature during test | (21.3 ± 0.2) °C | **** | 1 |

SAR result with Head TSL

| SAR averaged over 1 cm ² (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 | normalized to 1W | 40.4 mW/g ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Hesd 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 | normalized to 1W | 21.0 mW /g ± 16.5 % (k=2) |

Certificate No: D1900V2-5d075_Apr11

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Appendix

Antenna Parameters with Head TSL

| Impedance, transformed to feed point | 53.5 Ω + 6.1 jΩ |
|--------------------------------------|-----------------|
| Fleturn Loss | - 23.3 dB |

General Antenna Parameters and Design

| f**** | |
|----------------------------------|----------|
| 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 | January 24, 2006 |

Certificate No: D1900V2-5d075_Apr11

Page 4 of 6

| Testing Services | Appendix D for the BlackBe Report | Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR | | |
|---------------------|-----------------------------------|---|------------|--------------|
| Author Data | Dates of Test | Test Report No | FCC ID: | IC |
| Andrew Becker | Mar 04 – May 13, 2013 | RTS-6036-1305-12 | L6ARFT80UW | 2503A-RFT80U |

DASY5 Validation Report for Head TSL

Date/Time: 05.04.2011 12:41:39

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d075

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: f = 1900 MHz; $\sigma = 1.41 \text{ mho/m}$; $\varepsilon_r = 39$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

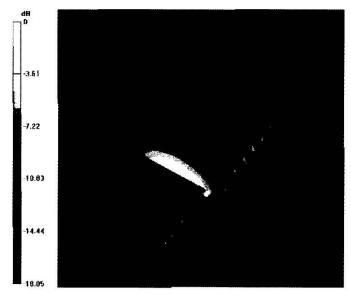
- Probe: ES3DV3 SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04,2010
- Sensor-Surface: 3mm (Machanical Surface Detection)
- Electronics; DAE4 Sn601; Calibrated: 10.06,2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Head / d=10mm, Pin=250 mW / Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 97.376 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 18.796 W/kg

SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.29 mW/gMaximum value of SAR (measured) = 12.476 mW/g



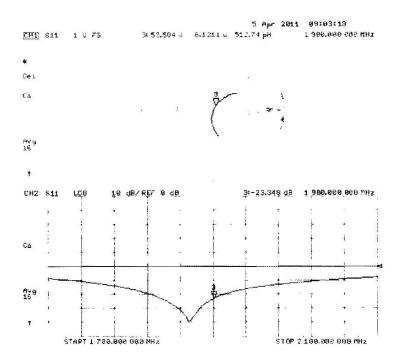
0 dB = 12.480 mW/g

Certificate No: D1900V2-5d075_Apr11

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Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d075_Apr11 Page 6 of 6



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Author Data **Andrew Becker** Dates of Test

Mar 04 – May 13, 2013

Test Report No

RTS-6036-1305-12

FCC ID: L6ARFT80UW

2503A-RFT80UW

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





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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

RTS (RIM Testing Services)

Accreditation No.: SCS 108

Certificate No: D1900V2-545 Jan13

| CALIBRATION C | ERTIFICATE | | |
|---|--|---|---|
| Object | D1900V2 - SN: 5 | 45 | |
| Calibration procedure(s) | QA CAL-05.v9 Calibration proces | dure for dipole validation kits abo | ve 700 MHz |
| | | | |
| Calibration date: | January 09, 2013 | Stating 13 section | |
| | | onal standards, which realize the physical un robability are given on the following pages an | |
| All calibrations have been conduc | cted in the closed laborator | y 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 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Power sensor HP 8481A | US37292783 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 27-Mar-12 (No. 217-01530) | Apr-13 |
| ype-N mismatch combination | SN: 5047.3 / 06327 | 27-Mar-12 (No. 217-01533) | Apr-13 |
| Reference Probe ES3DV3 | SN: 3205 | 28-Dec-12 (No. ES3-3205_Dec12) | Dec-13 |
| DAE4 | SN: 601 | 27-Jun-12 (No. DAE4-601_Jun12) | Jun-13 |
| Secondary Standards | ID# | Check Date (in house) | Scheduled Check |
| | MY41092317 | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| Power sensor HP 8481A | | 10 Out of (in modes officer out 11) | III House check. Oct-13 |
| | 100005 | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06 | 100005 US37390585 S4206 | [1.1] [2.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] [1.1] | |
| RF generator R&S SMT-06 | US37390585 S4206 | 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 In house check: Oct-13 |
| RF generator R&S SMT-06 Network Analyzer HP 8753E | | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by: | US37390585 S4206 Name | 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12) Function | In house check: Oct-13 In house check: Oct-13 Signature |
| Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E Calibrated by: Approved by: | US37390585 S4206 Name Israe El-Naouq | 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-12) Function Laboratory Technician | In house check: Oct-13 In house check: Oct-13 Signature |

Certificate No: D1900V2-545_Jan13

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Author Data Andrew Becker Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

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





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Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

tissue simulating liquid TSL

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.

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: D1900V2-545_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Measurement Conditions

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

| DASY Version | DASY5 | V52.8.4 |
|------------------------------|------------------------|-------------|
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom | |
| 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 | 39.4 ± 6 % | 1.38 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | **** | **** |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | and an initial through | |
|---|--------------------|--------------------------|--|
| SAR measured | 250 mW input power | 10.0 W/kg | |
| SAR for nominal Head TSL parameters | normalized to 1W | 40.2 W/kg ± 17.0 % (k=2) | |

| SAR averaged over 10 cm3 (10 g) of Head TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 250 mW input power | 5.26 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 21.1 W/kg ± 16.5 % (k=2) |

Certificate No: D1900V2-545_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12 FCC ID: L6ARFT80UW

2503A-RFT80UW

Appendix

Antenna Parameters with Head TSL

| Impedance, transformed to feed point | 51.0 Ω + 1.7 jΩ |
|--------------------------------------|-----------------|
| Return Loss | - 34.3 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

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_Jan13

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Author Data **Andrew Becker** Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12

L6ARFT80UW

FCC ID:

2503A-RFT80UW

DASY5 Validation Report for Head TSL

Date: 09.01.2013

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; $\sigma = 1.38 \text{ S/m}$; $\varepsilon_r = 39.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

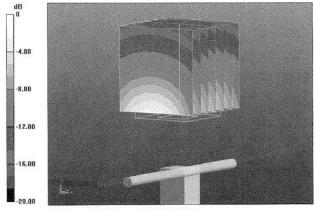
- Probe: ES3DV3 SN3205; ConvF(4.98, 4.98, 4.98); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 95.493 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 10 W/kg; SAR(10 g) = 5.26 W/kg

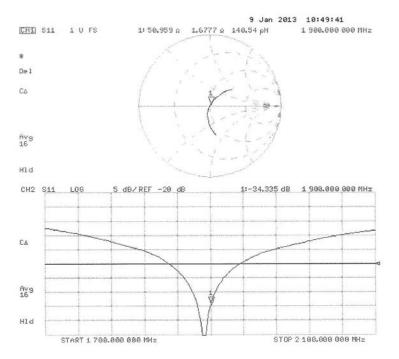
Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dBW/kg

| Testing Service | Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR Report | | | |
|--------------------|--|------------------|------------|---------------|
| Author Data | Dates of Test | Test Report No | FCC ID: | IC |
| Andrew Becker | Mar 04 – May 13, 2013 | RTS-6036-1305-12 | L6ARFT80UW | 2503A-RFT80UW |

Impedance Measurement Plot for Head TSL



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Author Data Andrew Becker Dates of Test

Mar 04 - May 13, 2013

Test Report No

RTS-6036-1305-12

FCC ID: L6ARFT80UW

2503A-RFT80UW

Calibration Laboratory of

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





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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

Client RTS (RIM Teeting Services) Accreditation No.: SCS 108

Certificate No: D2450V2-791_Apr11

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 791

QA CAL-05.v8 Calibration procedure(s)

Calibration procedure for dipole validation kits

Calibration date: April 5, 2011

This calibration certificate documents the (raceability 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)

| ID # | Call Date (Certificate No.) | Scheduled Calibration |
|--------------------|--|---|
| GB37480704 | 06-Oct-10 (No. 217-01266) | Oct-11 |
| US37292783 | 06-Oct-10 (No. 217-01266) | Oct-11 |
| SN: 5086 (20g) | 29-Mar-11 (No. 217-01368) | Apr-12 |
| SN: 5047.2 / 06327 | 29-Mar-11 (No. 217-01371) | Apr-12 |
| SN: 3205 | 30-Apr-10 (No. ES3-3205_Apr10) | Apr-11 |
| SN: 601 | 10-Jun-10 (No. DAE4-601_Jun10) | Jun-11 |
| ID# | Check Date (in house) | Scheduled Check |
| MY41092317 | 18-Oct-02 (in house check Oct-09) | In house check: Oct-11 |
| 100005 | 4-Aug-99 (in house check Oct-09) | In house check: Oct-11 |
| US37390585 S4206 | 18-Oct-01 (in house check Oct-10) | In house check: Oct-11 |
| Name | Function | Signature |
| Mike Metil | Laboratory Technician | i. Dei |
| Katja Pokovic | Technical Manager | an |
| | GB37480704 US37292783 SN: 5086 (20g) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100006 US37390585 S4206 Name Mike Melii | GB37480704 06-Oct-10 (No. 217-01266) US37292783 06-Oct-10 (No. 217-01266) SN: 5086 (20g) 29-Mar-11 (No. 217-01368) SN: 5047.2 / 06327 29-Mar-11 (No. 217-01371) SN: 3205 30-Apr-10 (No. ES3-3205_Apr-10) SN: 601 10-Jun-10 (No. DAE4-601_Jun10) ID # Check Date (in house) MY41092317 18-Oct-02 (in house check Oct-09) 10307390585 \$4206 18-Oct-01 (in house check Oct-09) US37390585 \$4206 18-Oct-01 (in house check Oct-10) Name Function Mike Melii Laboratory Technician |

Issued: April 6, 2011

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D2450V2-791_Apr11

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Author Data Andrew Becker Dates of Test Mar 04 – May 13, 2013 Test Report No RTS-6036-1305-12

L6ARFT80UW

FCC ID:

S

2503A-RFT80UW

Calibration Laboratory of

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





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Servizio evizzero di teratura Swiss Calibration Service

Accreditation No.: SCS 108

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

Glossary:

tissue simulating liquid TSL 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.

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- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Certificate No: D2450V2-791_Apr11 Page 2 of 6



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| Author Data | Dates of Test | Test Report No | FCC ID: | IC |
|---------------|-----------------------|------------------|------------|---------------|
| Andrew Becker | Mar 04 – May 13, 2013 | RTS-6036-1305-12 | L6ARFT80UW | 2503A-RFT80UW |

Measurement Conditions

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

| DASY Version | DASY5 | V52.6.2 |
|------------------------------|---------------------------|--|
| 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 | 2450 MHz ± 1 MHz | TO THE TOTAL CONTROL OF THE TOTAL CONTROL OT THE TOTAL CONTROL OF THE TO |

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 | 35.7 ± 6 % | 1.72 mho/m ± 6 % |
| Head TSL temperature during test | (21.0 ± 0.2) °C | * *** | 245.2 |

SAR result with Head TSL

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | ************************************** |
|---|--------------------|--|
| SAR measured | 250 mW input power | 19.3 mW / g |
| SAR normalized | normalized to 1W | 53.2 mW / g |
| SAR for nominal Head TSL parameters | normalized to 1W | 54.1 mW /g ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
|---|--------------------|---------------------------|
| SAR measured | 250 mW input power | 6.21 mW / g |
| SAR normalized | normalized to 1W | 24.8 mW / g |
| SAFI for nominal Head TSL parameters | normalized to 1W | 25.0 mW /g ± 16.5 % (k=2) |

Certificate No: D2450V2-791_April 1



Document

Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR Report

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Author Data
Andrew Becker

Dates of Test

Mar 04 – May 13, 2013

Test Report No **RTS-6036-1305-12**

FCC ID:

L6ARFT80UW

2503A-RFT80UW

Appendix

Antenna Parameters with Head TSL

| impedance, transformed to feed point | 55.5 Ω + 3.6 βΩ |
|--------------------------------------|-----------------|
| Return Loss | - 24.1 dB |

General Antenna Parameters and Design

| C | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.152 ns |
| | I |

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 Date

| Manufactured by | SPEAG |
|-----------------|------------------|
| Manufactured on | January 24, 2006 |

Certificate No: D2450V2-791_Apr11

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Document

Appendix D for the BlackBerry® Smartphone Model RFT81UW SAR Report

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Author Data
Andrew Becker

Dates of Test

Mar 04 - May 13, 2013

Test Report No **RTS-6036-1305-12**

L6ARFT80UW

FCC ID:

2503A-RFT80UW

DASY5 Validation Report for Head TSL

Date/Time: 05.04.2011 15:06:24

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:791

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: f = 2450 MHz; $\sigma = 1.74$ mho/m; $\varepsilon_{\tau} = 38.6$; $\rho = 1000$ kg/m³

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: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front): Type: QD000P50AA: Serial: 1001
- Measurement SW: DASY52, V52.6.2 Boild (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

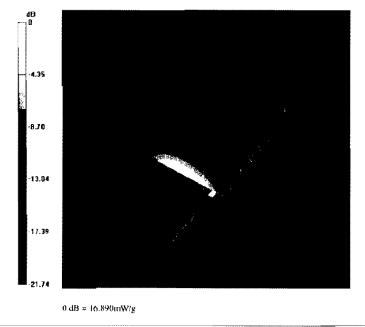
Head / d=10mm, Pin=250 mW / Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 102.4 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 27.237 W/kg

SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.21 mW/g

Maximum value of SAR (measured) = 16.889 mW/g

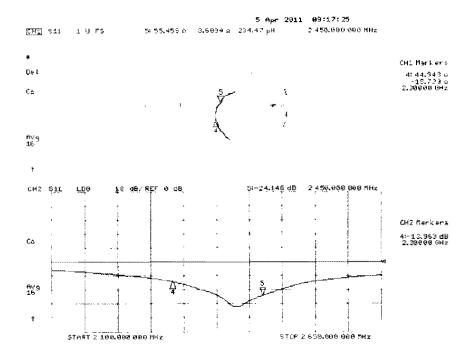


Certificate No: D2450V2-791_Apr11

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Impedance Measurement Plot for Head TSL





Impedance Measurement Plot for Head TSL

