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LD/SEMC/BGLVIM Ramadan Plicanic

Approved

LD/SEMC/BGLVIMC Peter Lindeborg

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Company Internal
REPORT

No.

BGLI08:593

Date

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Report issued by Accredited SAR Laboratory**for**

PY7A1052161 (F305)

Date of test: June 17th - July 1st, 2008**Laboratory:** Sony Ericsson SAR Test Laboratory
Sony Ericsson Mobile Communications AB
Nya Vattentornet
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Peter.Lindeborg@sonyericsson.com
+46 46 212 61 80**Statement of Compliance**

Sony Ericsson Mobile Communications AB declares under its sole responsibility that the product

Sony Ericsson Type AAC-1052161-BV; FCC ID PY7A1052161; IC 4170B-A1052161

to which this declaration relates, is in conformity with the appropriate RF exposure standards recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(None)

This laboratory is accredited to ISO/IEC 17025 (SWEDAC accreditation no. 1847).



Laboratories are accredited by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) under the terms of Swedish legislation. The accredited laboratory activities meet the requirements in SS-EN ISO/IEC 17025 (2005). This report may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

The results and statements contained herein relate only to the items tested. The names of individuals involved may be mentioned only in connection with the statements or results from this report.

Sony Ericsson encourages all feedback, both positive and negative, on this report.

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1 Introduction

In this test report, compliance of the Sony Ericsson PY7A1052161 (F305) portable telephone with RF safety guidelines is demonstrated. The applicable RF safety guidelines and the SAR measurement specifications used for the test are described in the SAR Measurement Specifications of Wireless Handsets [1].

2 Customer details

| | |
|----------------------|---|
| Company Name: | Sony Ericsson Mobile Communications AB |
| Address: | 2/F, Building A, Wang Jing High-Tech Park, No. 2, Li Ze Zhong Er Lu, Chao Yang District, Beijing, China |
| Contact Name: | Liu, Qinghua |

3 Device Under Test

3.1 Antenna Description

| | | |
|--------------------------------------|------------------|-------|
| Main Antenna Type | Internal antenna | |
| Location | Rear at bottom | |
| Main and BT antennas distance | 67 mm | |
| Dimensions of main antenna | Max length | 14 mm |
| | Max width | 40 mm |
| Configuration | Monopole | |

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3.2 Device Description

| | | | | | | |
|---|-----------------------------------|------|------|---------------|------|------|
| Device model | PY7A1052161 | | | | | |
| Market name | F305 | | | | | |
| IMEI number (EUT #) | 440107-271014-4 (#12207) | | | | | |
| Mode | GSM 1900 | | | GSM 850 | | |
| Crest factor | 8.3 | | | 8.3 | | |
| Multiple access scheme | TDMA | | | TDMA | | |
| Channel No. | 512 | 661 | 810 | 128 | 190 | 251 |
| Maximum output power setting¹ [dBm] | 30.0 | 30.0 | 30.0 | 33.0 | 33.0 | 33.0 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 30.5 | 30.5 | 30.5 | 33.5 | 33.5 | 33.5 |
| Data mode | GPRS | | | GPRS | | |
| Crest factor | 4.15 | | | 4.15 | | |
| Maximum output power setting¹ [dBm] | 28.5 | 28.5 | 28.5 | 31.5 | 31.5 | 31.5 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 29.0 | 29.0 | 29.0 | 32.0 | 32.0 | 32.0 |
| Data mode | EDGE | | | EDGE | | |
| Crest factor | 4.15 | | | 4.15 | | |
| Maximum output power setting¹ [dBm] | 27.5 | 27.5 | 27.5 | 28.5 | 28.5 | 28.5 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 28.0 | 28.0 | 28.0 | 29.0 | 29.0 | 29.0 |
| Transmitting frequency range [MHz] | 1850.2 - 1909.8 | | | 824.2 - 848.8 | | |
| GPRS Multi slot class | 10 | | | | | |
| EDGE class | 10 | | | | | |
| GPRS Capability class | B | | | | | |
| BT class and conducted power | Class 1, P=5.2mW | | | | | |
| Prototype or production unit | Preproduction | | | | | |
| Hardware version | AP1.1L | | | | | |
| Software version | CW813 | | | | | |
| Device category | Portable | | | | | |
| RF exposure environment | General population / uncontrolled | | | | | |

¹ Output power values were supplied by the customer.

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4 Test equipment

4.1 Dosimetry system

SAR measurements were made using the DASY4 professional system (software version 4.7, Build 53) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

| Description | Serial Number | Due Date |
|--------------------------------|---------------|----------|
| DASY DAE V1 | 640 | 01 2009 |
| E-field probe ES3DV3 | 3062 | 01 2009 |
| Dipole Validation Kit, D835V2 | 4d039 | 01 2010 |
| Dipole Validation Kit, D1900V2 | 5d073 | 01 2010 |

4.2 Additional equipment

| Description | Inventory Number | Due Date |
|-------------------------------|------------------|----------|
| Signal generator ESG-D4000A | INV 462935 | 03 2009 |
| Directional coupler HP778D | INV 2903 | 03 2009 |
| Power meter R&S NRVD | INV 20007668 | 03 2009 |
| Power sensor R&S NRV-Z5 | INV 20007670 | 03 2009 |
| Power sensor R&S NRV-Z5 | INV 20007671 | 03 2009 |
| Termination 65N50-0-11 | INV 2903 | 03 2009 |
| Network analyzer HP8753C | INV421671 | 03 2009 |
| S-parameter test set HP85047A | INV 421670 | 03 2009 |
| Dielectric probe kit HP85070D | INV 20000053 | Self cal |
| Termometer Fluke 51 | INV 2071 | 03 2009 |

5 Electrical parameters on the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ϵ_r , and the conductivity σ , of the tissue simulating liquids were measured with the dielectric probe kit. These values are shown in the table below. The mass density, ρ , entered into the DASY4 software is also given. Recommended limits for permittivity ϵ_r , conductivity σ and mass density ρ are also shown.

| f [MHz] | Tissue type | Measured / Recommended | Dielectric Parameters | | Density |
|---------|-------------|------------------------|-----------------------|----------------|-----------------------------|
| | | | ϵ_r | σ [S/m] | ρ [g/cm ³] |
| 835 | Head | Measured, 2008-06-17 | 40.8 | 0.87 | 1.00 |
| | | Recommended | 41.5 | 0.9 | 1.00 |
| 835 | Body | Measured, 2008-07-01 | 52.8 | 0.97 | 1.00 |
| | | Recommended | 55.2 | 0.97 | 1.00 |
| 1900 | Head | Measured, 2008-06-27 | 39.2 | 1.47 | 1.00 |
| | | Recommended | 40.0 | 1.4 | 1.00 |
| 1900 | Body | Measured, 2008-06-30 | 52.8 | 1.56 | 1.00 |
| | | Recommended | 53.3 | 1.52 | 1.00 |

6 System accuracy verification

A system accuracy verification of the DASY4 was performed using the dipole validation kit listed in section 3.1. The system verification test was conducted on the same day as the measurement of the DUT. The measurements were made at an ambient temperature of 21.2-22.7 °C and humidity 41-52 %. The obtained results are displayed in the table below.

RF noise had been measured in liquid when all RF equipment in lab was switched off. Measured value was 0.00012 mW/g in 1g mass.

| f [MHz] | Tissue type | Measured / Reference | SAR [W/kg] 1g / 10g | Dielectric Parameters | | Density | Liquid T [°C] |
|---------|-------------|----------------------|------------------------|-----------------------|----------------|-----------------------------|---------------|
| | | | | ϵ_r | σ [S/m] | ρ [g/cm ³] | |
| 835 | Head | Measured, 2008-06-17 | 9.17 / 6.02 | 40.8 | 0.87 | 1.00 | 21.7 |
| | | Reference | 9.68 / 6.38 | 41.5 | 0.9 | 1.00 | 22.0 |
| 835 | Body | Measured, 2008-07-01 | 9.64 / 6.35 | 52.8 | 0.97 | 1.00 | 22.6 |
| | | Reference | 9.41 / 6.25 | 55.2 | 0.97 | 1.00 | 22.0 |
| 1900 | Head | Measured, 2008-06-27 | 41.3 / 21.2 | 39.2 | 1.47 | 1.00 | 21.8 |
| | | Reference | 38.3 / 20.5 | 40.0 | 1.4 | 1.00 | 22.0 |
| 1900 | Body | Measured, 2008-06-30 | 41.0 / 21.2 | 52.8 | 1.56 | 1.00 | 21.9 |
| | | Reference | 37.9 / 20.3 | 53.3 | 1.52 | 1.00 | 22.0 |



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7 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sony Ericsson PY7A1052161 (F305) phone According to IEEE 1528

| Uncertainty Component | Uncer. (%) | Prob Dist. | Div. | C _i | 1g mass |
|--|------------|------------|------|----------------|---------|
| Measurement System | | | | | |
| Probe Calibration | ±5.9 | N | 1 | 1 | ±5.9 |
| Axial Isotropy | ±4.7 | R | √3 | 0.7 | ±1.9 |
| Spherical Isotropy | ±9.6 | R | √3 | 0.7 | ±3.9 |
| Boundary effect | ±1.0 | R | √3 | 1 | ±0.6 |
| Probe linearity | ±4.7 | R | √3 | 1 | ±2.7 |
| Detection limit | ±1.0 | R | √3 | 1 | ±0.6 |
| Readout electronics | ±0.3 | N | 1 | 1 | ±0.3 |
| Response time | ±0.8 | R | √3 | 1 | ±0.5 |
| Integration time | ±2.6 | R | √3 | 1 | ±1.5 |
| RF Ambient Conditions | ±3.0 | R | √3 | 1 | ±1.7 |
| Mech. Constraints of robot | ±0.4 | R | √3 | 1 | ±0.2 |
| Probe positioning | ±2.9 | R | √3 | 1 | ±1.7 |
| Extrap, interpolation and integration | ±1.0 | R | √3 | 1 | ±0.6 |
| Measurement System Uncertainty | | | | | ±8.4 |
| Test Sample Related | | | | | |
| Device positioning | ±3.5 | N | 1 | 1 | ±3.5 |
| Device holder uncertainty | ±3.5 | N | 1 | 1 | ±3.5 |
| Power drift | ±5.0 | R | √3 | 1 | ±2.9 |
| Test Sample Related Uncertainty | | | | | ±5.5 |
| Phantom and Tissue Parameters | | | | | |
| Phantom uncertainty | ±4.0 | R | √3 | 1 | ±2.3 |
| Liquid conductivity (measured) | ±2.5 | R | 1 | 0.64 | ±1.6 |
| Liquid conductivity (target) | ±5.0 | R | √3 | 0.64 | ±1.8 |
| Liquid Permittivity (measured) | ±2.5 | R | 1 | 0.6 | ±1.5 |
| Liquid Permittivity (target) | ±5.0 | R | √3 | 0.6 | ±1.7 |
| Phantom and Tissue Parameters Uncertainty | | | | | ±4.1 |
| Combined standard uncertainty | | | | | ±10.8 |
| Extended standard uncertainty (k=2) | | | | | ±21.6 |

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8 Test results

The ambient humidity and temperature of test facility were 41-52% and 21.2-22.7°C respectively. A base station simulator was used to control the device during the SAR measurement. The DUT was supplied with a fully charged battery for each measurement.

For head measurement, the DUT was tested on the right-hand side, and the left-hand side of the phantom in two phone positions, cheek (touch) and tilt (cheek + 15°) open and close. The DUT was tested at the lowest, middle and highest frequencies in the transmission band. The measured 1-gram averaged SAR values of the DUT towards the head are provided in Table 1.

For body measurement the DUT was tested with the back (antenna) and front (display) towards the phantom flat section with 15 mm distance in both speech and data mode. For all modes, the device was tested at the lowest, middle and highest frequencies in the transmission band. For portable hands free (PHF) usage the Sony Ericsson head set HPB-60 was connected to the DUT and for Bluetooth (BT) the DUT was paired with Sony Ericsson HBH-60. The measured 1-gram averaged SAR values of the DUT towards the body are provided in Table 2.

| Band | Channel | Measured output power ² [dBm] | Position | Liquid T [°C] | Measured SAR [W/kg] | |
|---------|----------|--|-------------|---------------|---------------------|-------------------|
| | | | | | Right-hand 1g mass | Left-hand 1g mass |
| GSM 850 | 128 | 33.2 | Cheek open | 21.7 | 0.68 | 0.69 |
| | | | Cheek close | 21.7 | 0.93 | 0.87 |
| | 190 | 33.4 | Cheek open | 21.7 | 0.87 | 0.88 |
| | | | Cheek close | 21.7 | 0.98 | 0.90 |
| | | | Tilt open | 21.7 | 0.47 | 0.43 |
| | | | Tilt close | 21.7 | 0.38 | 0.38 |
| | 251 | 33.5 | Cheek open | 21.7 | 0.88 | 0.89 |
| | | | Cheek close | 21.7 | 0.90 | 0.81 |
| | GSM 1900 | 512 | 30.5 | Cheek close | 21.8 | 0.79 |
| 661 | | 30.5 | Cheek open | 21.8 | 0.44 | 0.57 |
| | | | Cheek close | 21.8 | 0.78 | 0.69 |
| | | | Tilt open | 21.8 | 0.35 | 0.25 |
| | | | Tilt close | 21.8 | 0.53 | 0.49 |
| 810 | | 30.5 | Cheek close | 21.8 | 0.84 | 0.66 |

Table 1: SAR measurement result for Sony Ericsson PY7A1052161 telephone at highest possible output power. Measured towards the head.

² Measured output values were provided by the customer.

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| Band | Channel | Measured output power ³ [dBm] | Position / Mode | Liquid T [°C] | Measured SAR [W/kg] 1g mass |
|---------|----------|--|-----------------|---------------|-----------------------------|
| GSM 850 | 128 | 31.9 | Back / GPRS | 22.6 | 1.09 |
| | | 33.5 | Back / BT | 22.6 | 0.85 |
| | 190 | 32.0 | Back / GPRS | 22.6 | 1.17 |
| | | 32.0 | Front/GPRS | 22.6 | 0.63 |
| | | 28.0 | Back/EDGE | 22.6 | 0.39 |
| | | 33.5 | Back/PHF | 22.6 | 0.82 |
| | | 33.5 | Back / BT | 22.6 | 0.95 |
| | 251 | 32.0 | Back / GPRS | 22.6 | 0.94 |
| | | 33.5 | Back /BT | 22.6 | 0.80 |
| | GSM 1900 | 512 | 29.0 | Back / GPRS | 21.9 |
| 30.5 | | | Back / BT | 21.9 | 0.44 |
| 661 | | 29.0 | Back / GPRS | 21.9 | 0.52 |
| | | 29.0 | Front/GPRS | 21.9 | 0.26 |
| | | 28.0 | Back/EDGE | 21.9 | 0.43 |
| | | 30.5 | Back/PHF | 21.9 | 0.46 |
| | | 30.5 | Back / BT | 21.9 | 0.52 |
| 810 | | 29.0 | Back / GPRS | 21.9 | 0.47 |
| | | 30.4 | Back / BT | 21.9 | 0.52 |

Table 2: SAR measurement result for Sony Ericsson PY7A1052161 telephone at highest possible output power. Measured towards the body.

³ Measured output values were provided by the customer.

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- [2] FCC. "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio Frequency Emissions." Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97- 01).
- [3] IEEE. "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques." Std 1528-2003. June. 2003.
- [4] IEC 62209-1. "Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices in the frequency range of 300 MHz to 3 GHz". February 2005.

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10 Appendix

10.1 Photographs of the device under test



Battery and cover removed



Front side close



Rear side close

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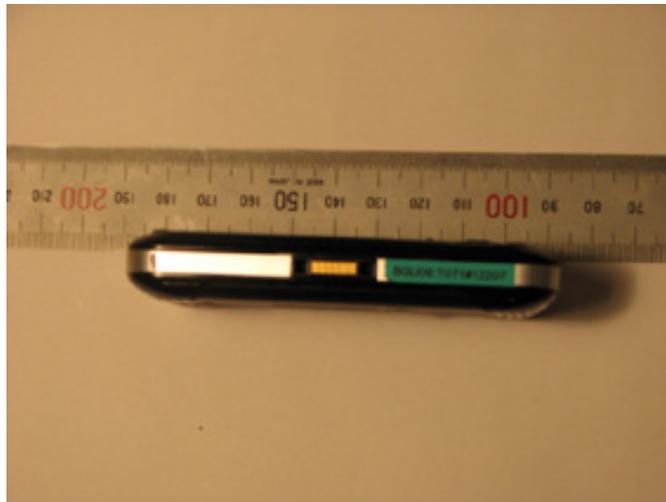
File



Front side open



Rear side open



System connector

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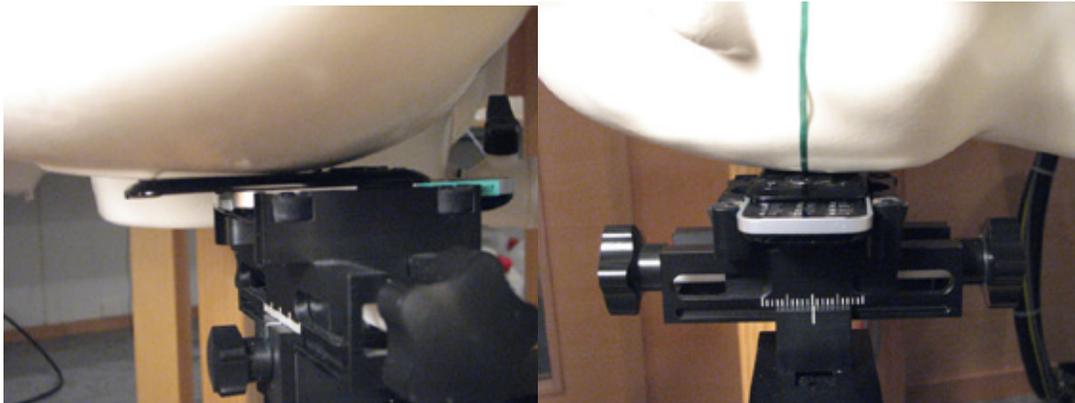
Reference

File

10.2 Device position at SAM Twin Phantom



DUT position towards the head: Cheek (touch) position close



DUT position towards the head: Cheek (touch) position open

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DUT position towards the head: Tilt (touch + 15°) position close



DUT position towards the head: Tilt (touch + 15°) position open

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DUT in body position with 15 mm distance

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10.3 Attachments

- System validation
- Measurement plots for head and body position
- Probe calibration
- Dipole calibration