Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		*GUG/N04:231*		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*20041006*	*041005*	A	

Report issued by Accredited SAR Laboratory

for

PY7AD021011

Date of test: *18, 20 and 21 September, 2004*

Laboratory:
Sony Ericsson SAR Test Laboratory
Sonyericsson Mobile Communications AB
Nya Vattentornet
SE-221 82 LUND, Sweden

Testing Engineer:
Ramadan Plicanic
Ramadan.Plicanic@sonyericsson.com
+46 46 19 38 62

Testing Approval
Mats Hansson
Mats.Hansson@sonyericsson.com
+46 46 19 33 57

Statement of Compliance

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

Sony Ericsson Type AAD-3021011-BV; FCC ID: PY7AD021011

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).

SWEDAC ACKREDITERING 1847 ISO/IEC 17025

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File

1 Table of contents

2 Introduction

In this test report, compliance of the Sony Ericsson PY7AD021011 (V800) 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].

3 Device Under Test

3.1 Antenna Description

Type	Internal	
Location	On top of big display on the back side	
Dimensions	Max length	45 mm
	Max width	20 mm
Configuration	PIFA	

3.2 Device description

Device model	PY7AD021011 (V800)
Serial number	CB50ZZ7GEP
Mode	GSM1900
Multiple Access Scheme	TDMA
Maximum Output Power Setting	30.0 dBm
Factory Tolerance in Power Setting	0.5 dB
Maximum Peak Output Power	30.5 dBm
Crest Factor	8
Transmitting Frequency Range(MHz)	1850.2 – 1909.8
Prototype or Production Unit	Preproduction
Device Category	Portable
RF exposure environment	General population / uncontrolled

4 Test equipment

4.1 Dosimetric system

SAR measurements were made using the DASY3 professional system (software version 3.1c) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

Description	***Serial Number***	***Due Date***
DASY3 DAE V1	433	April, 2005
E-field probe ETDV6	1569	March, 2005
Dipole Validation Kit, D1900V2	5d002	April, 2005

4.2 Additional equipment

Description	***Inventory Number***	***Due Date***
Signal generator ESG-D4000A	INV 462935	08, 2005
Directional coupler HP778D	INV 39656	01, 2005
Power meter R&S NRVD	INV 483920	01, 2006
Power sensor R&S NRV-Z5	INV 2333	11, 2005
Power sensor R&S NRV-Z5	INV 2334	01, 2006
Termination 65N50-0-11	INV 2903	02, 2005
Network analyzer HP8753C	INV421671	09, 2005
S-parameter test set HP85047A	INV 421670	09, 2005
Dielectric probe kit HP8507D	INV 20000053	01, 2005

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 DASY3 software is also given. Recommended limits for permittivity ε_r, conductivity σ and mass density ρ are also shown.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	ρ (g/cm³)
1900	**Head**	**Measured, 18/09/2004**	39.3	1.47	1.00
		Recommended	40.0	1.4	1.00
1900	**Head**	**Measured, 20/09/2004**	39.3	1.47	1.00
		Recommended	40.0	1.4	1.00
1900	**Body**	**Measured, 21/09/2004**	50.8	1.53	1.00
		Recommended	53.3	1.52	1.00

6 System accuracy verification

A system accuracy verification of the DASY3 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. Measurement made in ambient temperature 21.5-22 °C and humanity 47-51%. The obtained results are displayed in the table below.

RF noise had been measured in liquid when all RF equipment in lab was set off. Measured value was 0.002 mW/g in 1g mass.

f (MHz)	Tissue type	Measured / Reference	SAR (W/kg) 1g/10g	Dielectric Parameters			Liquid t(°C)
				ε_r	σ (S/m)	ρ (g/cm³)	
1900	**Head**	**Measured, 18/09/2004**	40.6/20.6	39.3	1.47	1.00	20.5
		Reference	41.6/21.5	38.8	1.44	1.00	-
1900	**Head**	**Measured, 20/09/2004**	40.8/20.6	39.3	1.47	1.00	21.0
		Reference	41.6/21.5	38.8	1.44	1.00	-
1900	**Body**	**Measured, 21/09/2004**	43.7/22.4	50.8	1.53	1.00	21.0
		Reference	43.2/22.4	51.2	1.59	1.00	-

7 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sonyericsson V800 phone

Uncertainty Component	Uncer. (%)	Prob Dist.	Div.	C_i	1900 Head	1900 Body
Measurement System						
Probe Calibration	±4.4	N	1	1	±4.4	±4.4
Axial Isotropy	±4.7	R	√3	0.5	±1.4	±1.4
Spherical Isotropy	±9.6	R	√3	0.5	±2.8	±2.8
Spatial resolution	±0.0	R	√3	1	±0.0	±0.0
Boundary effect	±5.5	R	√3	1	±3.2	±3.2
Probe linearity	±4.7	R	√3	1	±2.7	±2.7
Detection limit	±1.0	R	√3	1	±0.6	±0.6
Readout electronics	±1.0	N	1	1	±1.0	±1.0
Response time	±0.8	R	√3	1	±0.5	±0.5
Integration time	±1.4	R	√3	1	±0.8	±0.8
RF Ambient Conditions	±3.0	R	√3	1	±1.7	±1.7
Mech. Constraints of robot	±0.4	R	√3	1	±0.2	±0.2
Probe positioning	±2.9	R	√3	1	±1.7	±1.7
Extrap, interpolation and integration	±3.9	R	√3	1	±2.3	±2.3
Measurement System Uncertainty					**±7.7**	**±7.7**
Test Sample Related						
Device positioning	±6.0	N	0.89	1	±6.7	±6.7
Device holder uncertainty	±5.0	N	0.84	1	±5.9	±5.9
Power drift	±2.0/±2.0	R	√3	1	±1.2	±1.2
Test Sample Related Uncertainty					**±9.0**	**±9.0**
Phantom and Tissue Parameters						
Phantom uncertainty	±4.0	R	√3	1	±2.3	±2.3
Liquid conductivity (meas)	±5.0	R	√3	0.6	±1.4	±1.4
Liquid conductivity (target)	±1.7/±4.7	R	√3	0.6	±0.6	±1.6
Liquid Permittivity (meas)	±5.0	R	√3	0.6	±1.4	±1.4
Liquid Permittivity (target)	±5/±0.7	R	√3	0.6	±1.7	±0.2
Phantom and Tissue Parameters Uncertainty					**±3.5**	**±3.4**
Combined standard uncertainty					*±12.4*	*±12.3*
Extended standard uncertainty (k=2)					***±24.8***	***±24.6***

8 Test results

The measured 1-gram and averaged SAR values of the device against the head are provided in Tables 1 and body are provided in Tables 2. The ambient humidity and temperature of test facility were 51% - 45% and 20.5 °C – 24.0 °C respectively. The depth of the head tissue simulating liquid was 15.5cm. A base station simulator was used to control the device during the SAR measurement. The phone was supplied with full-charged battery for each measurement.

For head measurement, the device was tested on the right-hand phantom (corresponding to the right side of the head) and the left-hand phantom in two phone position, cheek (touch) and tilt (cheek + 15deg).

For body measurement phone was tested on the antenna to the phantom and back to the phantom on 15mm distance between phone and phantom. For all modes, the device was tested at the lowest, middle and highest frequencies in the transmit band. For Blue Tooth mode, phone was pared with Sony Ericsson HBH-600 Blue Tooth head sets and measured on worst case body position.

Mode	Channel	Peak Output Power(dBm)	Phone Position	Liquid temp(°C)	SAR (W/kg) in 1g mass	
					Right-hand	Left-hand
GSM 1900 Head	512	30.3	Cheek	20.5/21.0	**0.57**	0.56
			Tilt	21.0/21.5	0.57	**0.73**
	661	30.3	Cheek	20.5/21.0	0.46	0.55
			Tilt	21.0/21.5	0.5	0.58
	810	30.3	Cheek	20.5/21.0	0.46	0.55
			Tilt	21.0/21.5	0.54	0.61

Table1: SAR measurement result for Sony Ericsson PY7AD021011 (V800) telephone at highest possible output power. Measured against the head.

Mode	Channel	Peak Output Power(dBm)	Phone Position	Liquid temp °C	SAR (W/kg) in 1 g mass
GSM 1900 Body	512	30.3	Antenna to phantom	21.5	**0.43**
			Antenn. to phan. +BT	21.5	0.42
			Back to phantom	21.0	0.06
	661	30.3	Antenna to phantom	21.5	0.36
			Back to phantom	21.0	0.05
	810	30.3	Antenna to phantom	21.5	0.38
			Back to phantom	21.0	0.05

Table2: SAR measurement result for Sony Ericsson PY7AD021011 (V800) telephone at highest possible output power. Measured against the body.

9 References

[1] R.Plicanic, “SAR Measurement Specification of Wireless Handsets”, Sony Ericsson SAR Test Laboratory internal document GUG/N 03:141

[2] Basic standard for the Measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300MHz-3GHz), European Standard EN 50361, July 2001

[3] 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).

[4] 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.

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File

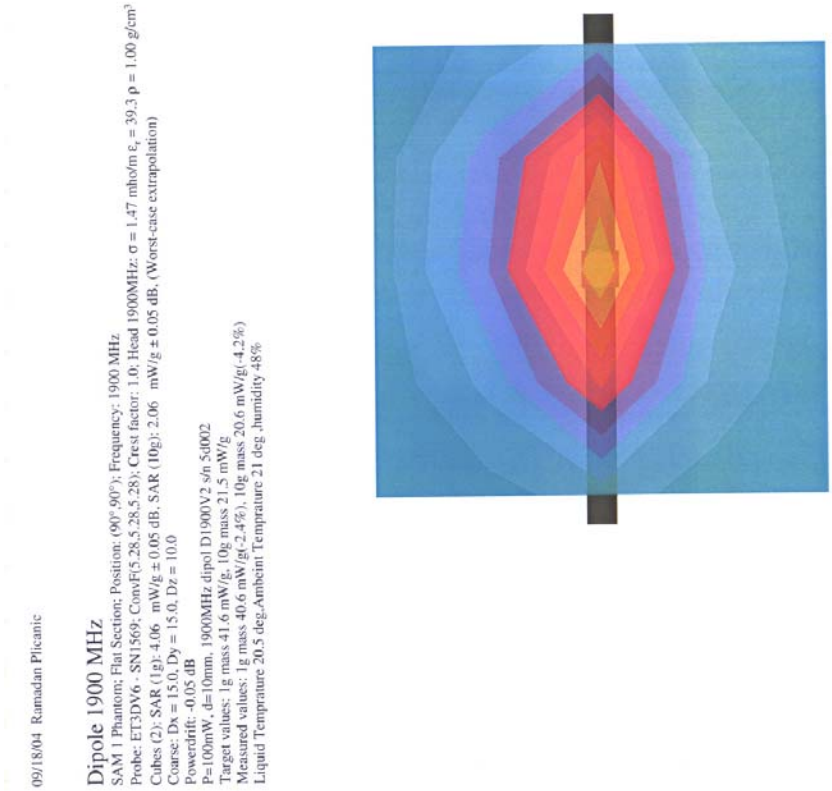
Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

10 Appendix

10.1 SAR distribution comparison for system accuracy verification

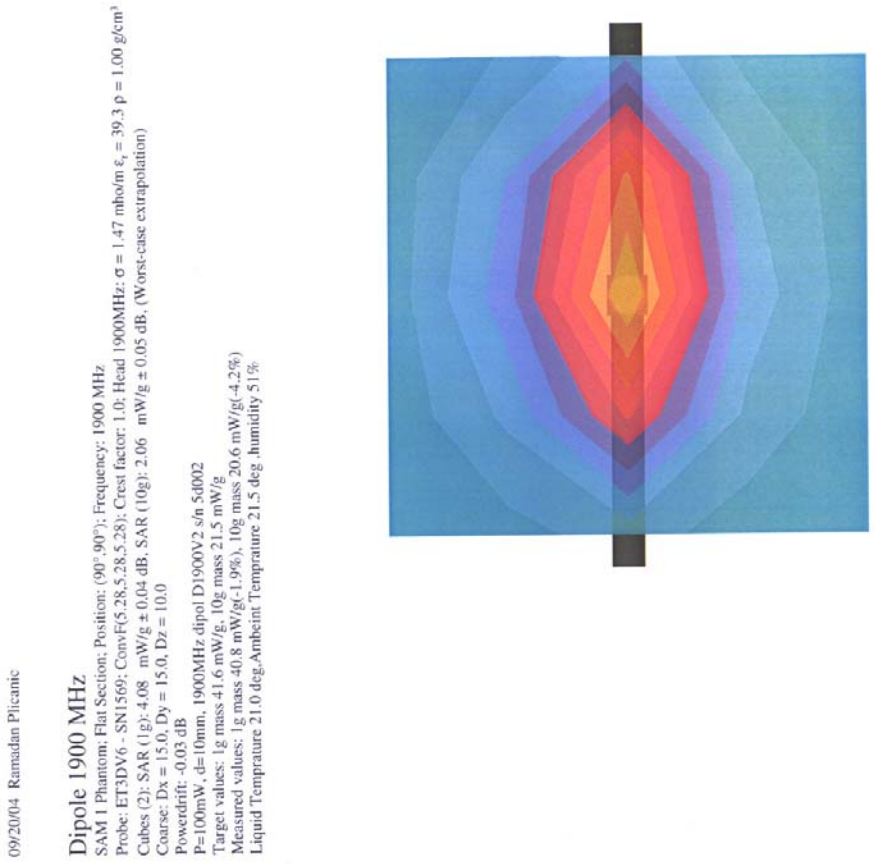


Validation dipole, measured with head simulating tissue on *18/09/2004*

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File



Validation dipole, measured with head simulating tissue on *20/09/2004*

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File

Date/Time: 04/09/03 18:49:39

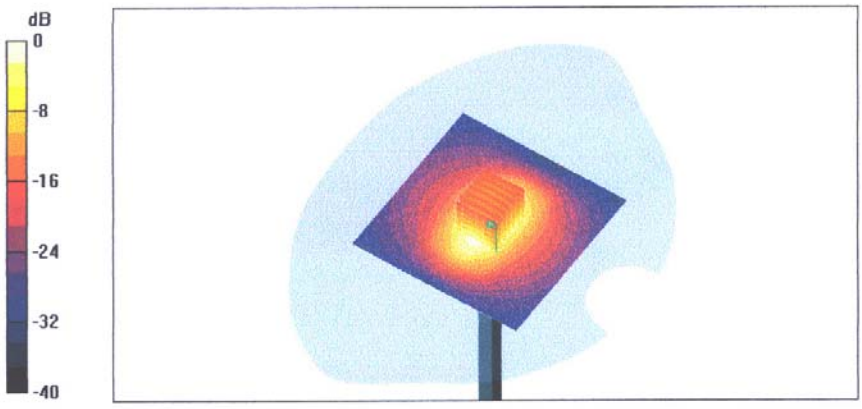
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d002_SN1507_HSL1900_090403.da4

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN5d002
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 MHz (σ = 1.44 mho/m, ε_r = 38.78, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(5.2, 5.2, 5.2); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.2 V/m
Peak SAR = 18.2 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.38 mW/g
Power Drift = 0.01 dB

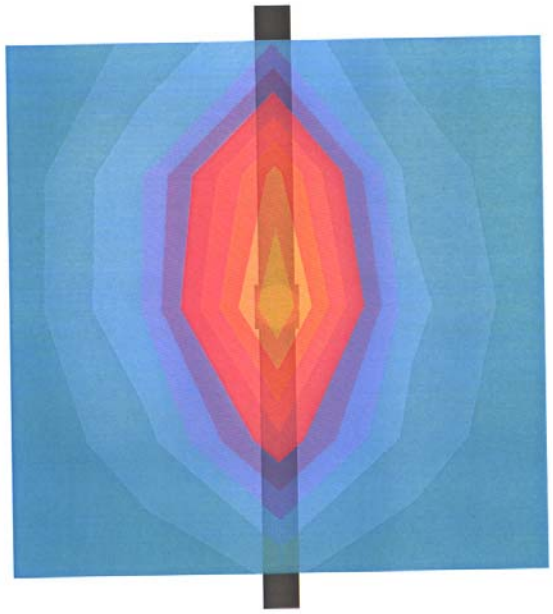


1900MHz SAR distribution of validation dipole from reference measurement with head simulating tissue

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File



09/21/04 Ramadan Plicanic

Dipole 1900 MHz
SAM 1 Phantom; Flat Section; Position: (90°,90°); Frequency: 1900 MHz
Probe: ET3DV6 - SN1569; ConvF(4.60,4.60,4.60); Crest factor: 1.0; Body 1900MHz: σ = 1.53 mho/m ε_r = 50.8 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 4.37 mW/g ± 0.04 dB, SAR (10g): 2.24 mW/g ± 0.05 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Powerdrift: -0.07 dB
P=100mW, d=10mm, 1900MHz dipol D1900V2 s/n 5d002
Target values: 1g mass 43.2 mW/g, 10g mass 22.4 mW/g
Measured values: 1g mass 43.7mW/g(+1.1%), 10g mass 22.4 mW/g(0%)
BODY LIQUID'S Temprature 21.0 deg ; Room's Temprature 21.5deg. 41%

Validation Dipole, measured with muscle simulating tissue on *21/09/2004*

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File

Date/Time: 04/08/03 12:31:50

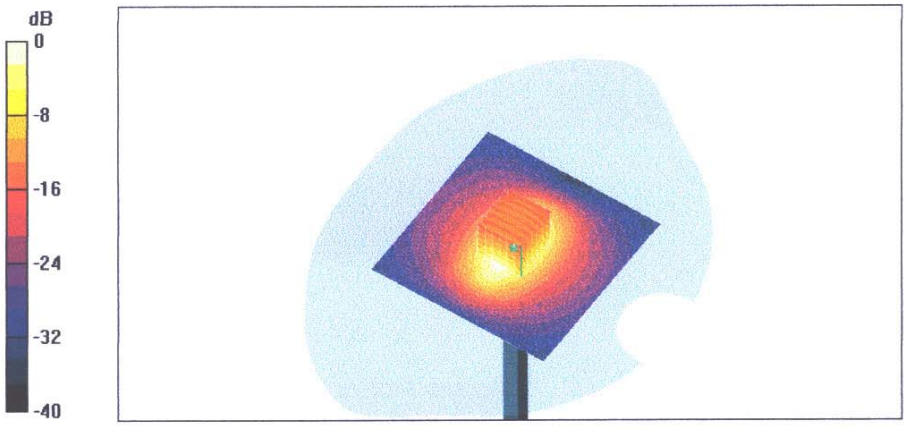
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d002_SN1507_M1900_080403.da4

DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d002
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Muscle 1900 MHz; (σ = 1.59 mho/m, ε_r = 51.2, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(4.8, 4.8, 4.8); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.8 V/m
Peak SAR = 18.9 W/kg
SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.6 mW/g
Power Drift = 0.02 dB



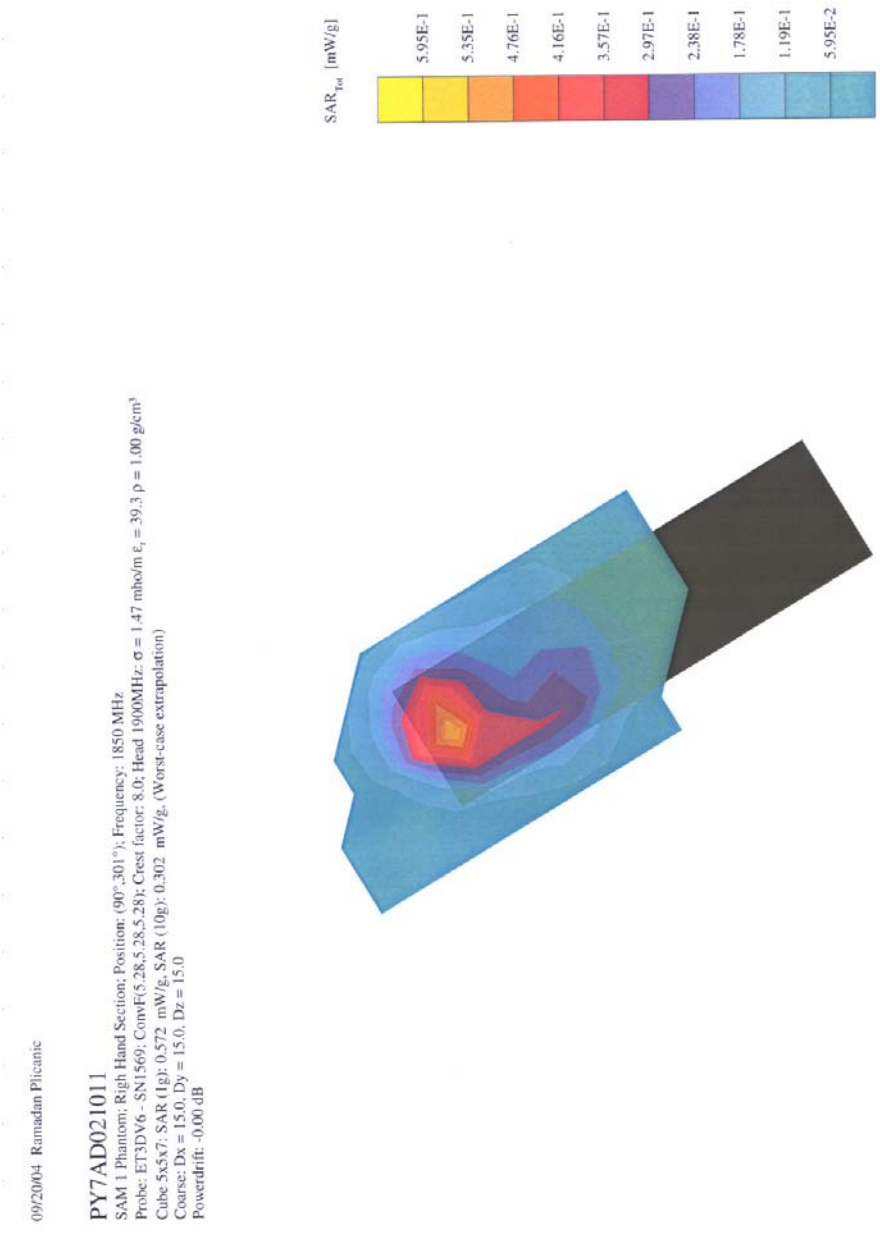
1900MHz SAR distribution of validation dipole from reference measurement with muscle simulating tissue

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File

10.2 SAR distribution plot

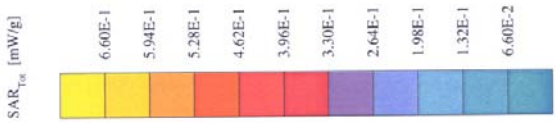


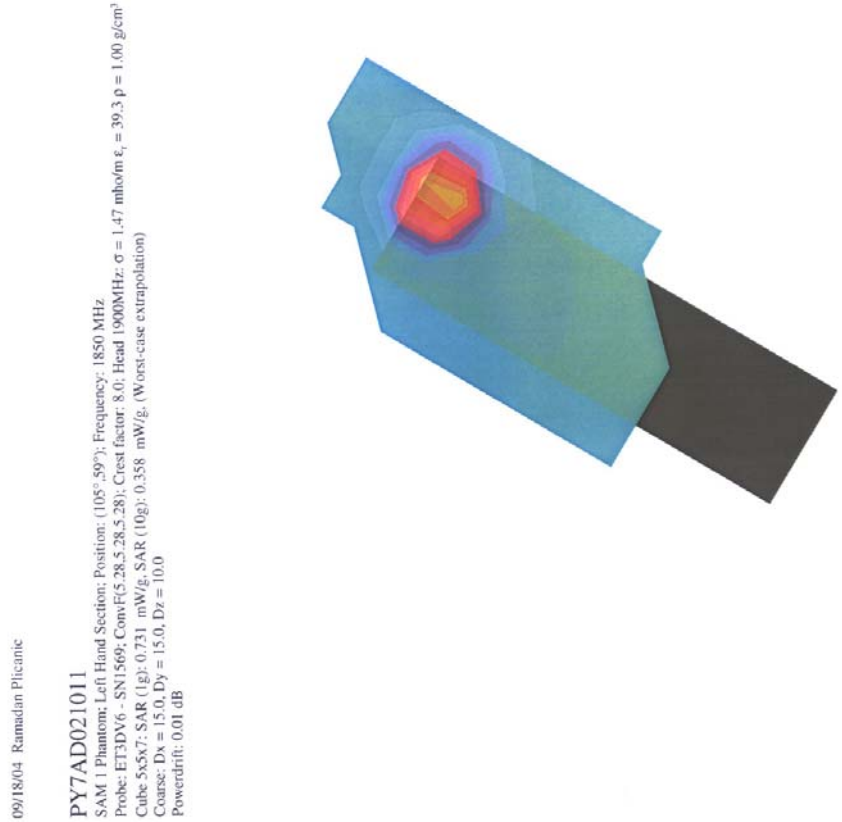
Distribution of max SAR in GSM1900 mode at 1850.2MHz. Measured against the head for cheek phone position

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File



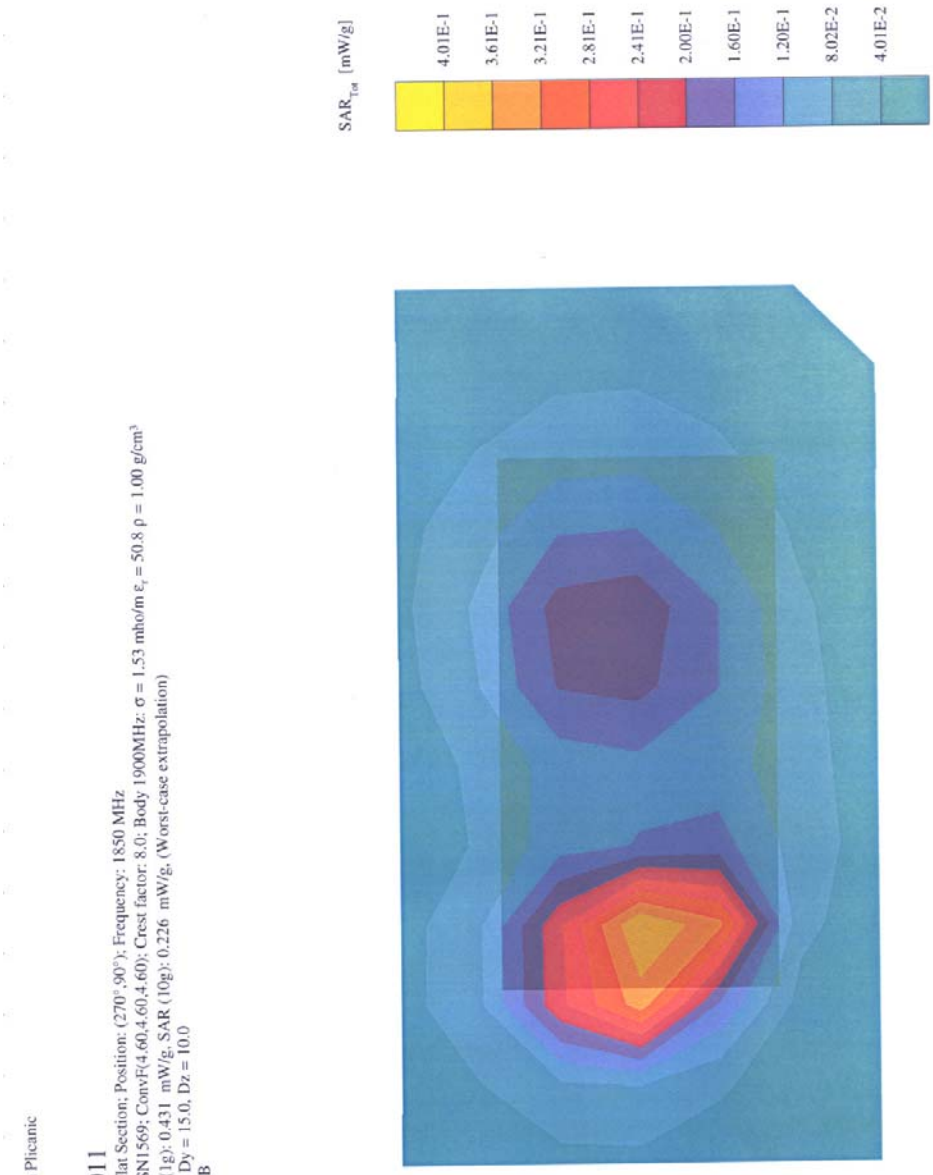


Distribution of max SAR in GSM1900 mode at 1850.2MHz. Measured against the head for tilt phone position

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File



Distribution of max SAR in GSM1900 mode at 1850.2MHz. Measured against the body for position antenna to the phantom

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

10.3 Photographs of the device under test

Front side

Phones system connector

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

Open Phone, Front side

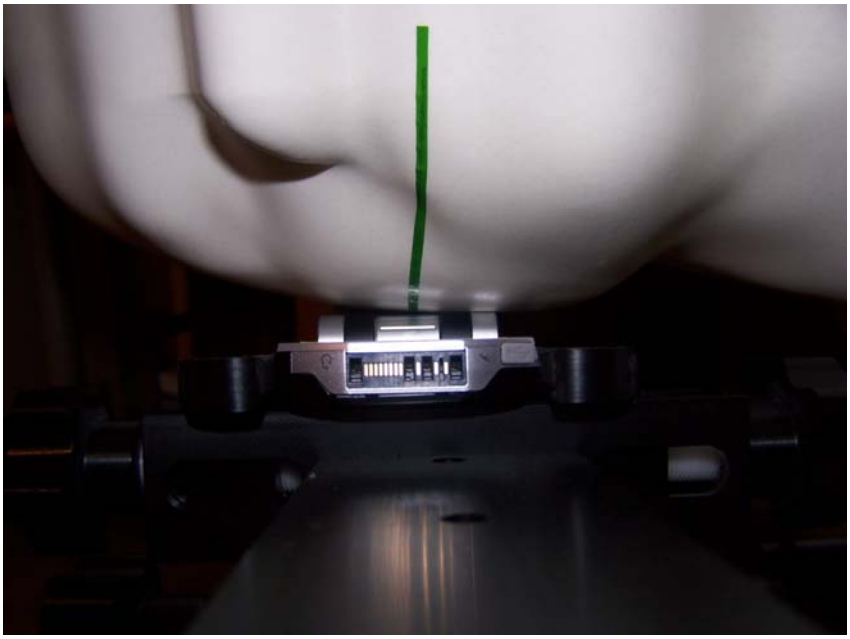
Open Phone, Back side and battery

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

10.4 Device position on SAM Twins Phantom

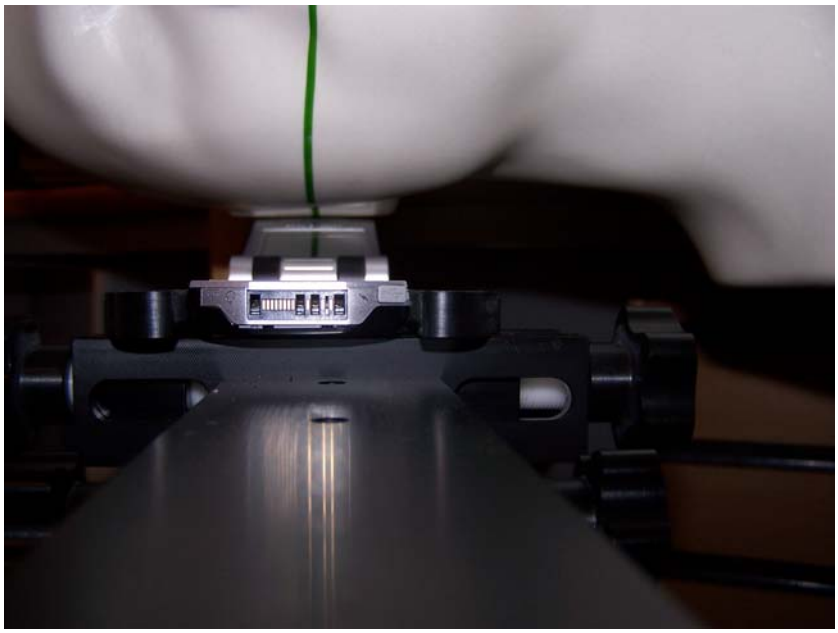


Device position against the head: Cheek (touch) phone position

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.			
LD/SEMC/BGGI/NM *Ramadan Plicanic*		GUG/N 04:231			
Approved	Checked	Date	Rev	Reference	
LD/SEMC/BGGI/NMC *Mats Hansson*	*Date*	*041005*	A	File	



Device position against the head: Tilt (cheek+15deg) phone position

Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

Device position against the body: Phone on 15mm distance from Flat phantom

Sony Ericsson

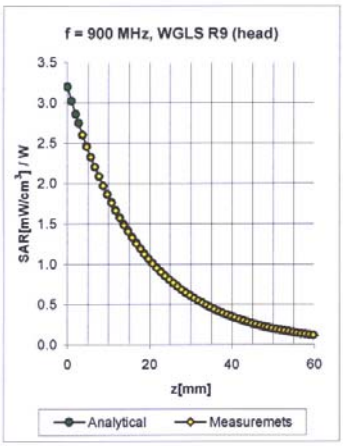
Company Internal
REPORT

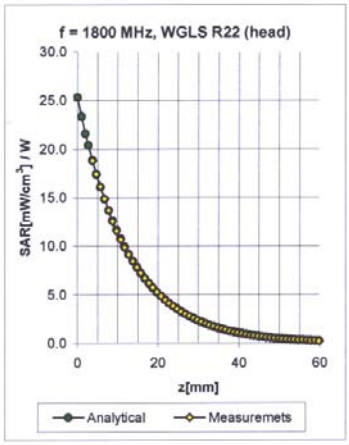
Prepared (also subject responsible if other)			No.		
LD/SEMC/BGGI/NM *Ramadan Plicanic*			GUG/N 04:231		
Approved		Checked	Date	Rev	Reference
LD/SEMC/BGGI/NMC *Mats Hansson*		*Date*	*041005*	A	File

10.5 Probe calibration parameters

ET3DV6 SN:1569 **March 18, 2004**

Conversion Factor Assessment





f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	785-885	Head	41.5 ± 5%	0.90 ± 5%	0.57	1.76	7.12 ± 9.7% (k=2)
900	850-950	Head	41.5 ± 5%	0.97 ± 5%	0.49	1.98	6.95 ± 9.7% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.43	2.75	5.56 ± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.44	2.97	5.28 ± 9.7% (k=2)
2000	1950-2050	Head	40.0 ± 5%	1.40 ± 5%	0.47	2.73	5.05 ± 9.7% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	0.79	2.03	4.72 ± 9.7% (k=2)
835	785-885	Body	55.2 ± 5%	0.97 ± 5%	0.39	2.28	6.72 ± 9.7% (k=2)
900	850-950	Body	55.0 ± 5%	1.05 ± 5%	0.51	1.92	6.60 ± 9.7% (k=2)
1750	1700-1800	Body	53.3 ± 5%	1.52 ± 5%	0.51	2.83	4.79 ± 9.7% (k=2)
1900	1850-1950	Body	53.3 ± 5%	1.52 ± 5%	0.55	2.90	4.60 ± 9.7% (k=2)
2000	1950-2050	Body	53.3 ± 5%	1.52 ± 5%	0.63	2.51	4.44 ± 9.7% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	1.01	1.64	4.34 ± 9.7% (k=2)

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

Page 7 of 8