

**TEST REPORT
FROM
RFI GLOBAL SERVICES LTD**

Test of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.

To: OET Bulletin 65 Supplement C: (2001-01)

Measurements were performed on the DASY4 System

Test Report Serial No:
RFI/SARE1/RP70868JD08A

This Test Report Is Issued Under The Authority Of Andrew Brown, Operations Manager: 	
Tested By: Scott D'Adamo 	Checked By: Joe Lomako 
Report Copy No: PDF01	
Issue Date: 03 May 2005	Test Dates: 02 March 2005 to 30 March 2005

It should be noted that the standard, OET Bulletin 65 Supplement C: (2001-01) is not listed on RFI's current UKAS schedule and is therefore "not UKAS accredited".

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields. Furthermore, the date of creation must match the issue date stated above.

This report may be copied in full.

RFI Global Services Ltd

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG

Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001

Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number: 2117901

RFI GLOBAL SERVICES LTD

TEST REPORT

S.No. RFI/SARE1/RP70868JD08A

Page 2 of 60

Issue Date: 03 May 2005

Test Of: Sony Ericsson Mobile Communications AB.

GC89 Mobile Station.

To: OET Bulletin 65 Supplement C: (2001-01)

This page has been left intentionally blank.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

Table of Contents

1. Client Information	4
2. Equipment Under Test (EUT)	5
3. Test Specification, Methods and Procedures	8
4. Deviations from the Test Specification	9
5. Operation of the EUT During Testing	10
6. Summary of Test Results	11
7. Measurements, Examinations and Derived Results	12
8. SAR Measurement System	19
9. SAR Safety Limits	20
10. Details of SAR Evaluation	21
11. Evaluation Procedures	22
12. System Validation	23
13. Simulated Tissues	24
14. Tissue Parameters	25
15. DAS4 Systems Specifications	26
16. Validation Results – 900 MHz Band (Body)	27
17. Validation Results – 1800 MHz Band (Body)	28
18. Validation Results – 900 MHz Band (Body)	29
19. Validation Results – 1800 MHz Band (Body)	30
20. Measurement Uncertainty	31
Appendix 1. Test Equipment Used	34
Appendix 2. SAR Distribution Scans	36
Appendix 3. Test Configuration Photograph	38
Appendix 4. Calibration Data	40
Appendix 5. Photographs of EUT	42

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

1. Client Information

Company Name:	Sony Ericsson Mobile Communications AB.
Address:	1 Lakeside Road Aerospace Centre Farnborough Hampshire GU14 6XP
Contact Name:	Mr M Bower

Test Laboratory

Company Name:	RFI Global Services Ltd.
Address:	Ewhurst Park Ramsdell Basingstoke Hampshire RG26 5RQ.
Contact Name:	Mr A Brown

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

2. Equipment Under Test (EUT)

The following information (with the exception of the date of receipt) has been supplied by the client:

2.1. Identification of Equipment Under Test (EUT)

Brand Name:	Sony Ericsson
Model Name or Number:	GC89
Unique Type Identification:	Prototype 3A
FCC Identification:	PY7 FF051011
Serial Number:	004601016299589
Battery Serial Number:	Not Applicable
Country of Manufacture:	None Stated
Date of Receipt:	02 March 2005

2.2. Accessories

Description:	External Antenna
Brand Name:	None Stated
Model Name or Number:	None Stated
Unique Type Identification:	None Stated
Serial Number:	None Stated
Battery Serial Number:	Not Applicable
Country of Manufacture:	None Stated
Date of Receipt:	02 March 2005

2.3. Description of EUT

The equipment under test is a Dual Band (GSM 850 & GSM 1900) Mobile Station (PCMCIA Card) incorporating WLAN technologies, exercised via two different host laptops.

2.4. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

2.5. Additional Information Related to the EUT

Equipment Class:	GSM 850 / GSM 1900 / WLAN 2450		
FCC Rule Part(s):	OET Bulletin 65 Supplement C		
Device Category:	Portable		
Application Type:	Certification		
Maximum Power Output:	GSM 850	33 dBm	
	GSM 1900	30 dBm	
	WLAN 2450	17 dBm	
Transmitter Frequency Range: (Client Specified)	GSM 850	824.0 MHz to 849.0 MHz	
	GSM 1900	1850.0 MHz to 1910.0 MHz	
	WLAN 2450	2412 MHz to 2462 MHz	
Transmit Frequency Allocation of EUT When Under Test (Channels):	Channel Number	Channel Description	Frequency (MHz)
	512	Low	1850.2
	660	Middle	1879.8
	810	High	1909.8
	128	Low	824.2
	189	Middle	836.4
	251	High	848.80
	1	Low	2412.0
	6	Middle	2437.0
	11	High	2462.0
Modulation(s):	217 Hz		
Modulation Scheme (Crest Factor):	8.3		
Antenna Length and Type:	Integral / External 85mm		
Number Of Antenna Positions:	1 Fixed		
Intended Operating Environment:	Within Network Coverage		
Weight:	46.79g (With External Antenna)		
Dimensions (without Antenna) mm:	100 (L) x 55 (W) x 10 (H) mm		
Power Supply Requirement:			
DC Supply (Volts/Amps)	Not Applicable		
AC Supply (Volts/Amps)	Not Applicable		
Internal Battery Supply:	Not Applicable		
Other:	3.3V supplied via host laptop		

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

2.6. Port Identification

Port	Description	Type	Applicable
1	Enclosure	-	Y
2	SIM	Standard Test	N
3	Card Bus	32 Bit	N
4	RF	Unique to Manufacturer	N

2.7. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Laptop
Brand Name:	DELL
Model Name or Number:	Latitude D600
Serial Number:	CD-0D2125-48643-4CB-645
Cable Length and Type:	Not Applicable
Connected to Port:	PCMCIA

Description:	Laptop
Brand Name:	COMPAQ
Model Name or Number:	EVO N610C
Serial Number:	6060A0098201
Cable Length and Type:	Not Applicable
Connected to Port:	PCMCIA

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	OET Bulletin 65 Supplement C: (2001-01)
Title:	Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

EN 50361: 2001

Title: Basic standard for the measurement of specific absorption rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz).

ANSI/IEEE C95.1: 1999

IEEE standard for safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz.

Federal Communications Commission, "Evaluating compliance with FCC Guidelines for human exposure to radio frequency electromagnetic fields", OET Bulletin 65 Supplement C, FCC, Washington, D.C, 20554, 2001.

Thomas Schmid, Oliver Egger and Neils Kuster, "Automated E-field scanning system for dosimetric assessments", IEEE Transaction on microwave theory and techniques, Vol. 44, pp. 105-113, January 1996.

Neils Kuster, Ralph Kastle and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of communications, Vol. E80-B, No.5, pp. 645-652, May 1997.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements as detailed in OET Bulletin 65 Supplement C, Appendix D.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

4. Deviations from the Test Specification

The equipment under test is a Dual Band (GSM 850 & GSM 1900) Mobile Station (PCMCIA Card) incorporating WLAN technologies. RFI Global Services Ltd. Has performed SAR measurements with the EUT, exercised via only two different host laptops.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

5. Operation of the EUT During Testing

5.1. Operating Modes

At the client's request the EUT was tested in the following operating mode(s):

GSM 850 and GSM 1900 Transmit mode only – WLAN enabled (2450 MHz)

5.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

Exercised via two different host laptops. Measurements were performed with the EUT, 0 degrees to the phantom and 90 degrees to the phantom consecutively, with a separation distance of 15mm.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

6. Summary of Test Results

Test Name	Specification Reference	Compliance Status
Specific Absorption Rate (SAR)	OET Bulletin 65 Supplement C	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to section 24 for details of measurement uncertainties.

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

7.2. Test Results

7.2.1. Test Results for Specific Absorption Rate – 850 MHz DELL

Test Summary:

Maximum Level (W/kg):	0.545
Limit (W/kg):	1.600
Margin (W/kg):	1.055

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 24.0
Temperature Variation in Liquid (°C):	21.1 to 22.2

EIRP/ERP Measurement	Refer to section 7.2.7
----------------------	------------------------

Results:

Position	Section	Channel Number	Level 1g (W/kg)	Limit 1g (W/kg)	Margin 1g (W/kg)	Note(s)	Result
DELL Laptop 0 Degrees to Phantom with Integral Antenna	Flat	189	0.306	1.600	1.294	-	Complied
DELL Laptop 90 Degrees to Phantom with Integral Antenna	Flat	189	0.264	1.600	1.336	-	Complied
DELL Laptop 0 Degrees with External Antenna 0 Degrees	Flat	189	0.435	1.600	1.165	-	Complied
DELL Laptop 0 Degrees with External Antenna 90 Degrees	Flat	189	0.419	1.600	1.181	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	189	0.250	1.600	1.350	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 90 Degrees	Flat	189	0.157	1.600	1.443	-	Complied
DELL Laptop 0 Degrees with External Antenna 0 Degrees	Flat	128	0.449	1.600	1.151	-	Complied
DELL Laptop 0 Degrees with External Antenna 0 Degrees	Flat	251	0.545	1.600	1.055	-	Complied

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

7.2.2. Test Results for Specific Absorption Rate – 1900 MHz DELL

Test Summary:

Maximum Level (W/kg):	0.663
Limit (W/kg):	1.600
Margin (W/kg):	0.937

Environmental Conditions:

Temperature Variation in Lab (°C):	23.0 to 24.0
Temperature Variation in Liquid (°C):	23.3 to 23.4

EIRP/ERP Measurement	Refer to section 7.2.7
----------------------	------------------------

Results:

Position	Section	Channel Number	Level 1g (W/kg)	Limit 1g (W/kg)	Margin 1g (W/kg)	Note(s)	Result
DELL Laptop 0 Degrees to Phantom with Integral Antenna	Flat	660	0.322	1.600	1.278	-	Complied
DELL Laptop 90 Degrees to Phantom with Integral Antenna	Flat	660	0.122	1.600	1.478	-	Complied
DELL Laptop 0 Degrees with External Antenna 0 Degrees	Flat	660	0.497	1.600	1.103	-	Complied
DELL Laptop 0 Degrees with External Antenna 90 Degrees	Flat	660	0.335	1.600	1.265	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	660	0.572	1.600	1.028	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 90 Degrees	Flat	660	0.334	1.600	1.266	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	512	0.663	1.600	0.937	-	Complied
DELL Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	810	0.496	1.600	1.104	-	Complied

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

7.2.3. Test Results for Specific Absorption Rate – 850 MHz COMPAQ

Test Summary:

Maximum Level (W/kg):	0.374
Limit (W/kg):	1.600
Margin (W/kg):	1.226

Environmental Conditions:

Temperature Variation in Lab (°C):	22.0 to 23.0
Temperature Variation in Liquid (°C):	22.7 to 22.8

EIRP/ERP Measurement	Refer to section 7.2.7
----------------------	------------------------

Results:

Position	Section	Channel Number	Level 1g (W/kg)	Limit 1g (W/kg)	Margin 1g (W/kg)	Note(s)	Result
COMPAQ Laptop 0 Degrees to Phantom with Integral Antenna	Flat	189	0.374	1.600	1.226	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with Integral Antenna	Flat	189	0.135	1.600	1.465	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	189	0.374	1.600	1.226	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 90 Degrees	Flat	189	0.325	1.600	1.275	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	189	0.194	1.600	1.301	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with External Antenna 90 Degrees	Flat	189	0.299	1.600	1.301	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with Integral Antenna	Flat	128	0.303	1.600	1.297	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with Integral Antenna	Flat	251	0.356	1.600	1.244	-	Complied

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

Test Results for Specific Absorption Rate – 850 MHz COMPAQ (Continued)

Position	Section	Channel Number	Level 1g (W/kg)	Limit 1g (W/kg)	Margin 1g (W/kg)	Note(s)	Result
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	128	0.283	1.600	1.317	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	251	0.354	1.600	1.246	-	Complied

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

7.2.4. Test Results for Specific Absorption Rate – 1900 MHz COMPAQ

Test Summary:

Maximum Level (W/kg):	0.550
Limit (W/kg):	1.600
Margin (W/kg):	1.050

Environmental Conditions:

Temperature Variation in Lab (°C):	24.0 to 25.0
Temperature Variation in Liquid (°C):	24.3 to 24.3

EIRP/ERP Measurement	Refer to section 7.2.7
----------------------	------------------------

Results:

Position	Side of Head	Channel Number	Level 1g (W/kg)	Limit 1g (W/kg)	Margin 1g (W/kg)	Note(s)	Result
COMPAQ Laptop 0 Degrees to Phantom with Integral Antenna	Flat	660	0.371	1.600	1.229	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with Integral Antenna	Flat	660	0.078	1.600	1.522	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	660	0.550	1.600	1.050	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 90 Degrees	Flat	660	0.343	1.600	1.257	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with External Antenna 0 Degrees	Flat	660	0.337	1.600	1.263	-	Complied
COMPAQ Laptop 90 Degrees to Phantom with External Antenna 90 Degrees	Flat	660	0.327	1.600	1.273	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	512	0.522	1.600	1.078	-	Complied
COMPAQ Laptop 0 Degrees to Phantom with External Antenna 0 Degrees	Flat	810	0.434	1.600	1.166	-	Complied

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

7.2.5. EIRP/ERP Measurement

DELL Laptop GSM 850

Date: 07 March 2005:

Channel	TX Power Before Test / dBm
128	33.4
189	32.5
251	32.8

DELL Laptop GSM 1900

Date: 08 March 2005

Channel	TX Power Before Test / dBm
512	23.9
660	26.1
810	25.4

COMPAQ Laptop GSM 850

Date: 09 March 2005

Channel	TX Power Before Test / dBm
128	33.5
189	32.6
251	32.8

COMPAQ laptop GSM 1900

Date: 24 March 2005

Channel	TX Power Before Test / dBm
512	23.4
660	25.4
810	25.3

Note(s):

1. EIRP/ERP measurements are performed before testing only.

Test Of: Sony Ericsson Mobile Communications AB.**GC89 Mobile Station.****To: OET Bulletin 65 Supplement C: (2001-01)**

8. SAR Measurement System

RFI Global Services Ltd, SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller; teach pendant (Joystick), and remote control. This is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. The data acquisition electronics (DAE) performs signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection etc. The DAE is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

9. SAR Safety Limits

Exposure Limits (General Populations/Uncontrolled Exposure Environment)	SAR (W/Kg)
Spatial Peak (averaged over any 1 g of tissue)	1.6

Note(s):

- OET Bulletin 65 Supplement C SAR safety limits specified in the table above applies to devices operated in the general population / uncontrolled exposure environment.*
- Uncontrolled environments are defined as locations where there is exposure of individuals who have no knowledge or control of their exposure.*

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

10. Details of SAR Evaluation

10.1. The equipment under test was found to be compliant for localised specific absorption rate (SAR) based on the following provisions and conditions:

- a) The PCMCIA Modem was exercised via a host laptop and positioned under the flat section of the phantom.
- b) Measurements were performed with the EUT, 0 degrees to the phantom and 90 degrees to the phantom consecutively.
- c) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimise the drift.
- d) The device was keyed to operate continuously in the transmit mode for the duration of the test.
- e) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
- f) The EUT was tested via a host laptop, powered by AC mains adapter. The host laptop supplied a 3.3V / 1A supply to the PCMCIA Modem.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

11. Evaluation Procedures

The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

- a) (i) The evaluation was performed in an applicable area of the phantom depending on the type of device being tested. For devices worn about the ear during normal operation, both the left and right ear positions were evaluated at the centre frequency of the band at maximum power. The side, which produced the greatest SAR, determined which side of the phantom would be used for the entire evaluation. The positioning of the head worn device relative to the phantom was dictated by FCC OET Bulletin 65 Supplement C.

(ii) For body worn devices or devices which can be operated within 20 cm of the body, the flat section of the phantom was used. The type of device being evaluated dictated the distance of the EUT to the outer surface of the phantom flat section.
- b) The SAR was determined by a pre-defined procedure within the DASY4 software. The exposed region of the phantom was scanned near the inner surface with a grid spacing of 20mm x 20mm or appropriate resolution.
- c) A 7x7x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.
- d) If the EUT had any appreciable drift over the course of the evaluation, then the EUT was re-evaluated. Any unusual anomalies over the course of the test also warranted a re-evaluation.

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

12. System Validation

Prior to the assessment, the system was verified in the flat region of the phantom. A 900 MHz, 1800 MHz and 2450 MHz dipole were used respectively. A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of $\pm 5\%$ for the 900 MHz, 1800 MHz and 2450 MHz dipole respectively. The applicable verification (normalised to 1 Watt) is as follows:

Dipole Validation Kit	Target SAR 1g (W/kg)	Measured SAR 1g (W/kg)
D900V2 / 124 (07/03/05)	11.00	11.00
D1800V2 / 264 (08/03/05)	37.00	36.88
D900V2 / 124 (09/03/05)	11.00	10.56
D1800V2 / 264 (24/03/05)	37.00	38.44

Test Of: Sony Ericsson Mobile Communications AB.

GC89 Mobile Station.

To: OET Bulletin 65 Supplement C: (2001-01)

13. Simulated Tissues

The body mixture consists of water and glycol. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient	Frequency
	900 MHz Body
De-Ionised Water	50.75%
Sugar	48.21%
Salt	0.94%
Kathon	0.10%

Ingredient	Frequency
	1800 MHz (1900 MHz) Body
De-Ionised Water	69.79%
DGMBE	30.00%
Salt	0.20%

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

14. Tissue Parameters

The dielectric parameters of the fluids were verified prior to the SAR evaluation using a 58070C Dielectric Probe Kit and an 8753E network analyser. The dielectric parameters of the fluid are as follows:

Frequency (MHz)	Equivalent Tissue	Dielectric Constant ϵ_r	Conductivity σ (mho/m)
900 (07/03/05)	Body	52.81	1.01
1800 (08/03/05)	Body	53.15	1.56
900 (09/03/05)	Body	52.81	1.01
1800 (24/03/05)	Body	51.39	1.49

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

15. DASY4 Systems Specifications

Robot System

Positioner: Stäubli Unimation Corp. Robot Model: RX90L
Repeatability: 0.025 mm
No. of Axis: 6
Serial Number: F00/SD89A1/A/01
Reach: 1185 mm
Payload: 3.5 kg
Control Unit: CS7
Programming Language: V+

Data Acquisition Electronic (DAE) System

Cell Controller

PC: Dell Precision 340
Operating System: Windows NT
Data Card: DASY4 Measurement Server
Serial Number: 1080

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter and control logic.
Software: DASY4 Software
Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock.

PC Interface Card

Function: 24 bit (64 MHz) DSP for real time processing Link to DAE3 16 bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.

E-Field Probe

Model: ET3DV6
Serial No: 1529 and 1528
Construction: Triangular core fibre optic detection system
Frequency: 10 MHz to 3 GHz
Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Probe Length (mm): 337
Probe Diameter (mm): 12
Tip Length (mm): 10
Tip Diameter (mm): 6.8
Sensor X Offset (mm): 2.7
Sensor Y Offset (mm): 2.7
Sensor Z Offset (mm): 2.7

Phantom

Phantom: SAM Phantom
Shell Material: Fibreglass
Thickness: 2.0 ± 0.1 mm

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

16. Validation Results – 900 MHz Band (Body)

Date: 07 March 2005

16.1. System Validation

Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1g volume (W/kg) at 900 MHz	Measured Value of SAR in 1g volume (W/kg) at 900 MHz	Percentage Difference ($\leq 5\%$)
D900V2 / 124	11.00	11.00	(0.00%) Yes

A 900 MHz dipole was used to perform 850 MHz body system validation. This was possible as the device centre frequency is within ± 100 MHz of the verification frequency.

15.2 Liquid Properties

Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (900 MHz)	Measured/Calculated Value (900 MHz)	Percentage Difference ($\leq 5\%$)
Relative Permittivity	55.00	52.81	(-3.98%) Yes
Conductivity	1.05	1.01	(-3.68%) Yes

15.3 Temperature Variation

The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15.0 °C to +30.0 °C.

The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	24.0	23.0
Tissue Simulating Liquid	22.2	22.1

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

17. Validation Results – 1800 MHz Band (Body)

Date: 08 March 2005

17.1. System Validation

Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1g volume (W/kg) at 1800 MHz	Measured Value of SAR in 1g volume (W/kg) at 1800 MHz	Percentage Difference ($\leq 5\%$)
D1800V2 / 264	37.00	36.88	(-0.30%) Yes

An 1800 MHz dipole was used to perform 1900 MHz body system validation. This was possible as the device centre frequency is within ± 100 MHz of the verification frequency.

16.2. Liquid Properties

Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (1800 MHz)	Measured/Calculated Value (1800 MHz)	Percentage Difference ($\leq 5\%$)
Relative Permittivity	53.30	53.15	(-0.28%) Yes
Conductivity	1.52	1.56	(2.42%) Yes

16.3. Temperature Variation

The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15.0 °C to +30.0 °C.

The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	24.0	23.0
Tissue Simulating Liquid	23.4	23.3

Test Of: Sony Ericsson Mobile Communications AB.
 GC89 Mobile Station.
 To: OET Bulletin 65 Supplement C: (2001-01)

18. Validation Results – 900 MHz Band (Body)

Date: 09 March 2005

18.1. System Validation

Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1g volume (W/kg) at 900 MHz	Measured Value of SAR in 1g volume (W/kg) at 900 MHz	Percentage Difference ($\leq 5\%$)
D900V2 / 124	11.00	10.56	(-4.00%) Yes

An 900 MHz dipole was used to perform 850 MHz body system validation. This was possible as the device centre frequency is within ± 100 MHz of the verification frequency.

16.2. Liquid Properties

Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (900 MHz)	Measured/Calculated Value (900 MHz)	Percentage Difference ($\leq 5\%$)
Relative Permittivity	55.00	52.81	(-3.98%) Yes
Conductivity	1.05	1.01	(-3.68%) Yes

16.3. Temperature Variation

The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15.0 °C to +30.0 °C.

The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	23.0	22.0
Tissue Simulating Liquid	22.8	22.7

Test Of: Sony Ericsson Mobile Communications AB.
GC89 Mobile Station.
To: OET Bulletin 65 Supplement C: (2001-01)

19. Validation Results – 1800 MHz Band (Body)

Date: 24 March 2005

19.1. System Validation

Validation of the system test configuration was carried out prior to testing.

Validation Dipole Type and Serial No.	Calibrated Value of SAR in 1g volume (W/kg) at 1800 MHz	Measured Value of SAR in 1g volume (W/kg) at 1800 MHz	Percentage Difference ($\leq 5\%$)
D1800V2 / 264	37.00	38.44	(3.90%) Yes

An 1800 MHz dipole was used to perform 1900 MHz body system validation. This was possible as the device centre frequency is within ± 100 MHz of the verification frequency.

16.2. Liquid Properties

Properties of the tissue simulating liquid were measured prior to testing.

Property	Target Value (1800 MHz)	Measured/Calculated Value (1800 MHz)	Percentage Difference ($\leq 5\%$)
Relative Permittivity	53.30	51.39	(-3.20%) Yes
Conductivity	1.52	1.49	(-2.08%) Yes

16.3. Temperature Variation

The temperature of the laboratory and within the tissue simulating liquid for this test shall not exceed the range +15.0 °C to +30.0 °C.

The actual temperature measured at the beginning and end of each test was recorded and the maximum range is shown below:

Measurement	Maximum Temperature	Minimum Temperature
Laboratory	25.0	24.0
Tissue Simulating Liquid	24.3	24.3