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Appendix 4. Photographs

This appendix contains the following photographs:

Photo Reference Number	Title
PHT/49684JD01/001	Test configuration for the measurement of Specific Absorption Rate (SAR)
PHT/49684JD01/002	Front Of EUT Facing Phantom
PHT/49684JD01/003	Rear Of EUT Facing Phantom
PHT/49684JD01/004	Front Of EUT Facing Phantom With Lanyard & Lapel Clip
PHT/49684JD01/005	Front Of EUT
PHT/49684JD01/006	Rear Of EUT
PHT/49684JD01/007	Close Up View Of EUT
PHT/49684JD01/008	EUT Battery
PHT/49684JD01/009	EUT Charger
PHT/49684JD01/010	EUT Lanyard
PHT/49684JD01/011	EUT Lapel Clip
PHT/49684JD01/012	900MHz Body Fluid Level
PHT/49684JD01/013	1900MHz Fluid Level

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PHT/49684JD01/001: Test configuration for the measurement of Specific Absorption Rate (SAR)



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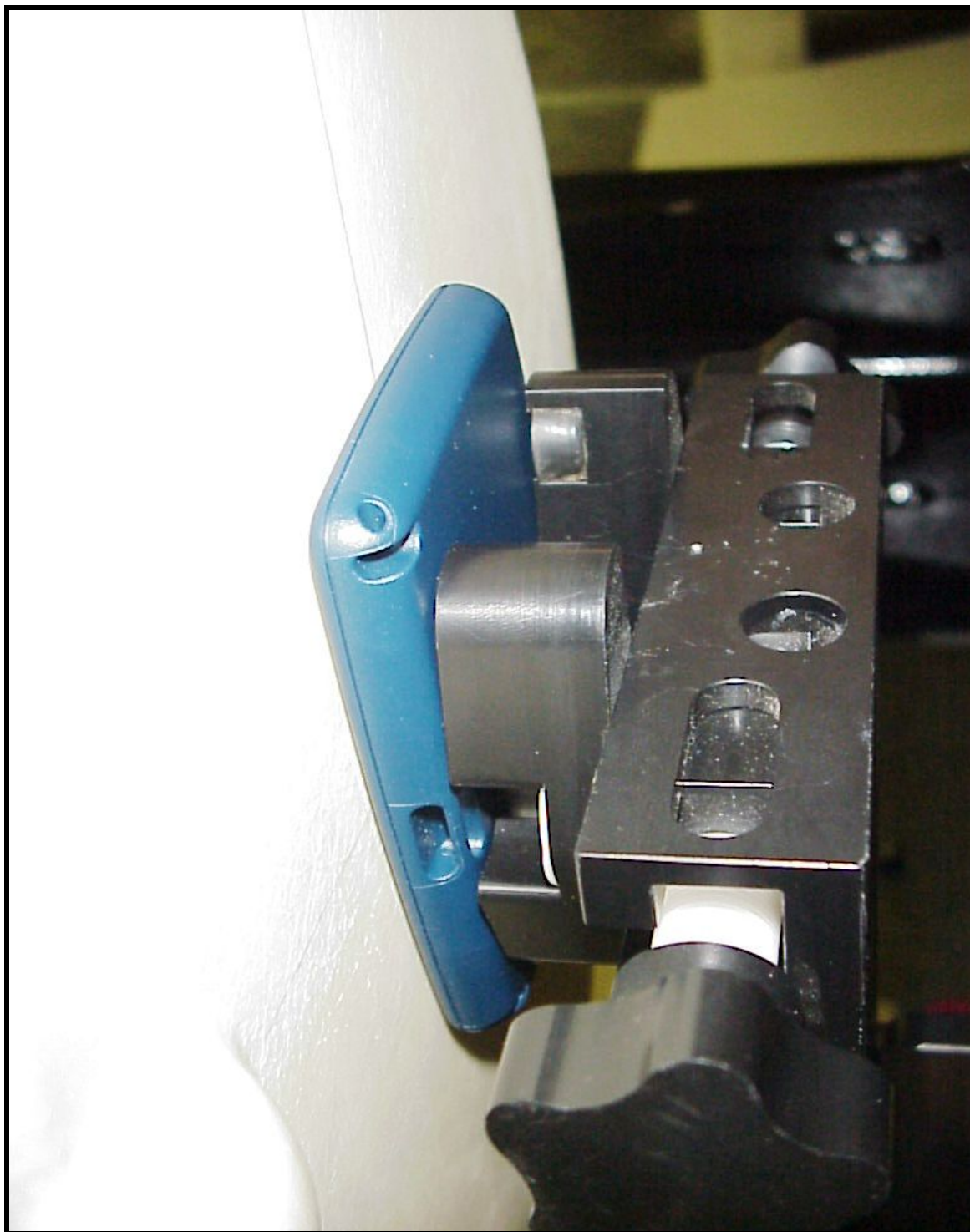
PHT/49684JD01/002: Front Of EUT Facing Phantom



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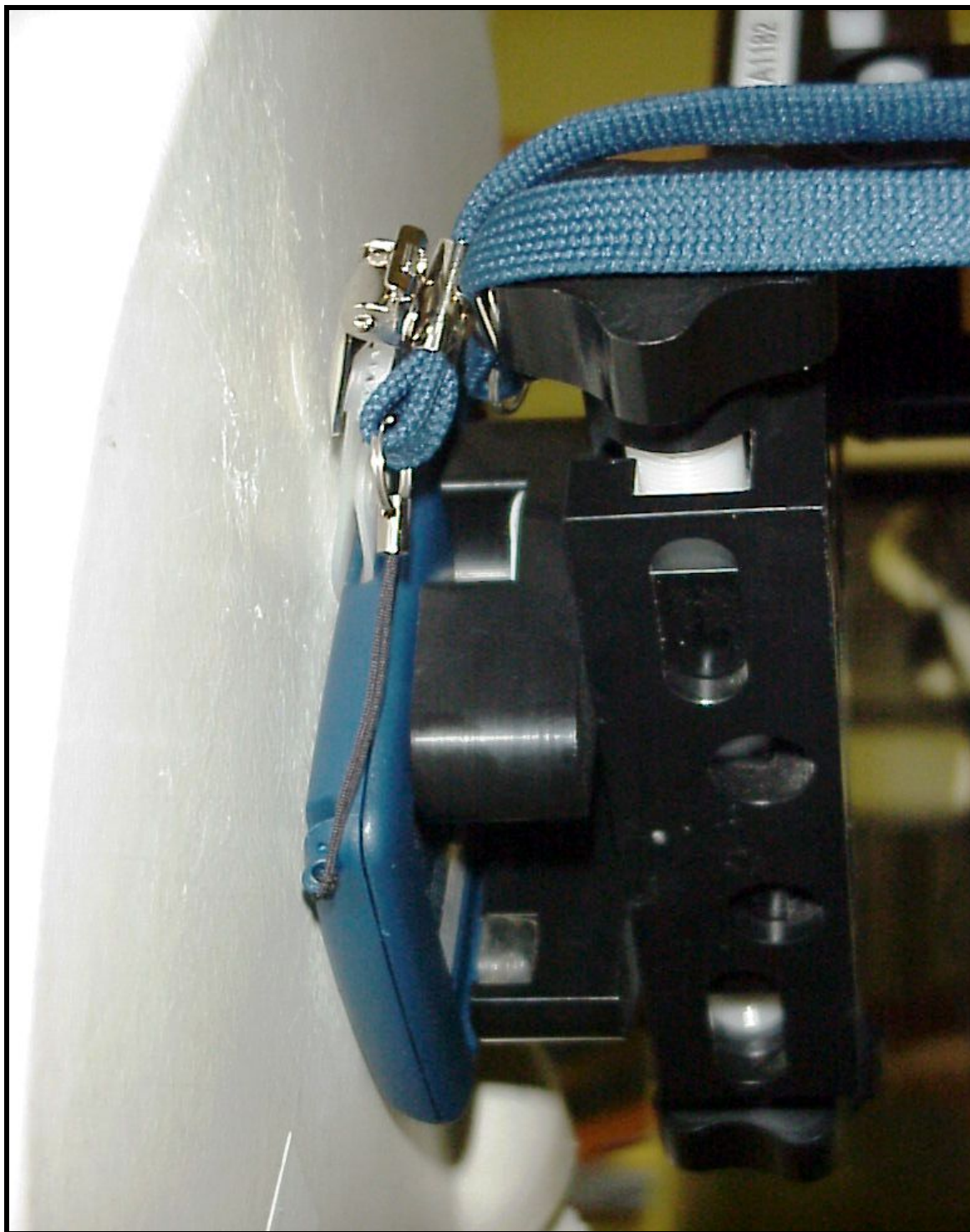
PHT/49684JD01/003: Rear Of EUT Facing Phantom



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PHT/49684JD01/004: Front Of EUT Facing Phantom With Lanyard & Lapel Clip



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PHT/49684JD01/005: Front Of EUT



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PHT/49684JD01/006: Rear Of EUT



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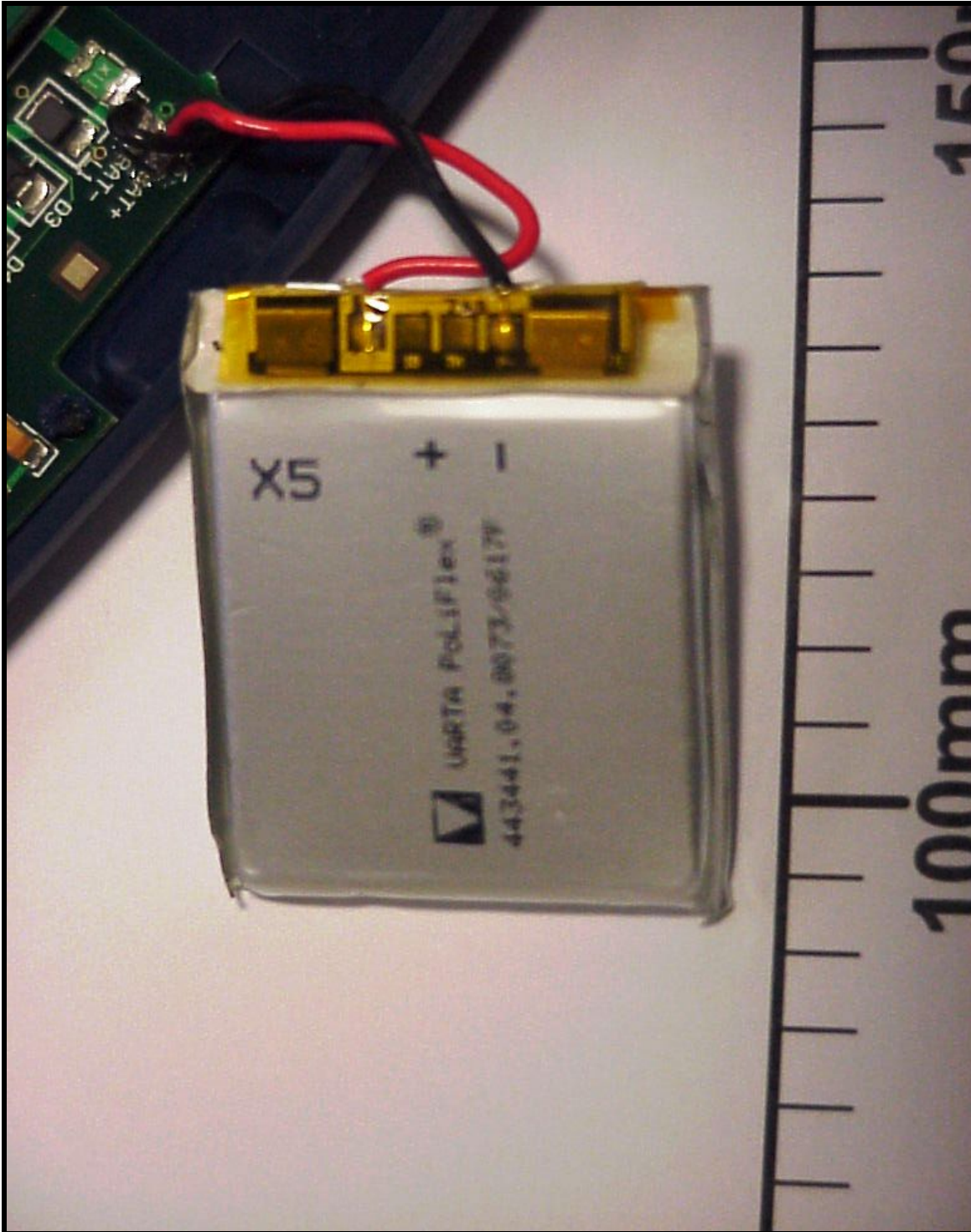
PHT/49684JD01/007: Close Up View Of EUT



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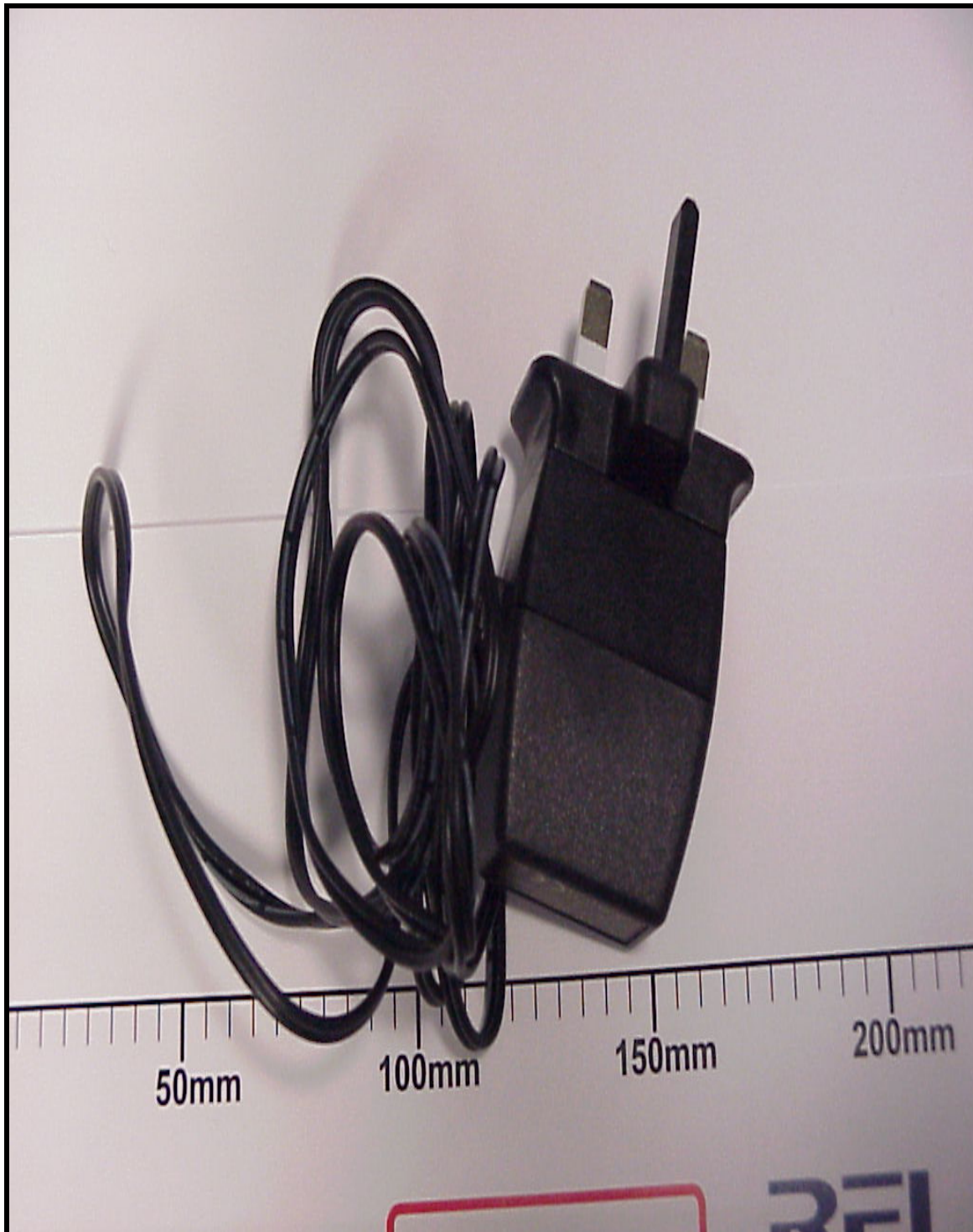
PHT/49684JD01/008: EUT Battery



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PHT/49684JD01/009: EUT Charger



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PHT/49684JD01/010: EUT Lanyard



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PHT/49684JD01/011: EUT Lapel Clip



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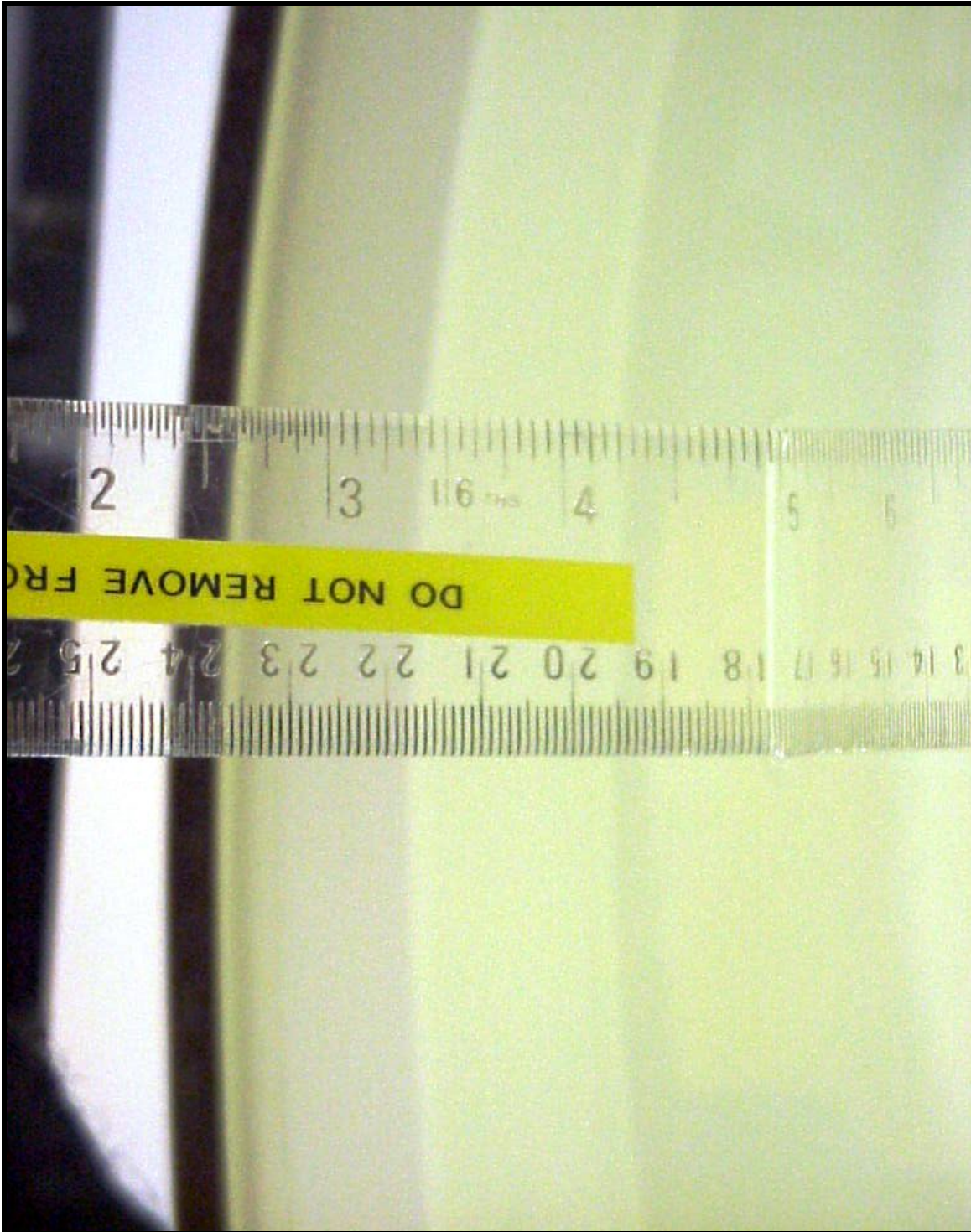
PHT/49684JD01/012: 900MHz Body Fluid Level



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PHT/49684JD01/013: 1900MHz Fluid Level



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Appendix 5. Validation of System

Prior to the assessment, the system was verified in the flat region of the phantom. 900 and 1900 MHz dipole was used. 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 and 1900 MHz dipole. The applicable verification (normalised to 1 Watt).

Date:06/12/2007**Validation Dipole and Serial Number:D900V2 SN:185**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	23.0 °C	23.0 °C	ϵ_r	55.00	53.61	-0.03	5.00
				σ	1.05	1.04	-0.01	5.00
				1g SAR	10.50	10.44	-0.57	5.00
				10g SAR	6.88	6.76	-1.74	5.00

Date:**Validation Dipole and Serial Number:**

Simulant	Frequency (MHz)	Room Temperature	Liquid Temperature	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	23.0 °C	23.0 °C	ϵ_r	53.30	53.57	0.01	5.00
				σ	1.52	1.60	0.05	5.00
				1g SAR	38.00	39.00	2.63	5.00
				10g SAR	20.7	20.28	-2.03	5.00

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Appendix 6. 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
	1800/1900 MHz Body
De-Ionised Water	69.79%
Diglycol Butyl Ether (DGBE)	30.00%
Salt	0.20%

Ingredient	Frequency
	835/850/900 MHz Body
De-Ionised Water	50.75%
Sugar	48.21%
Salt	0.94%
Kathon	0.10%

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Appendix 7. DASY4 System Details

A.7.1. DASY4 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.

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A.7.2. DASY4 SAR System 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

Serial Number:	DAE3 SN:394
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Cell Controller

PC:	Dell Precision 340
Operating System:	Windows 2000
Data Card:	DASY4 Measurement Server
Serial Number:	1080

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converted 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.
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DASY4 SAR System Specifications (Continued)

E-Field Probe

Model:	ET3DV6
Serial No:	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
