

APPENDIX C DESCRIPTION OF SAR MEASUREMENT SYSTEM

Probe Positioning System

The measurements were performed with the state-of-the-art automated near-field scanning system **DASY5 Version 52** from Schmid & Partner Engineering AG (SPEAG). The DASY5 fully complies with the IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

E-Field Probe Type and Performance

The SAR measurements were conducted with SPEAG dosimetric probe EX3DV4 Serial: 3657. Please refer to appendix D for detailed information.

Data Acquisition Electronics

The data acquisition electronics (DAE3) consists of 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. The input impedance of the DAE3 box is 200 M Ω ; the inputs are symmetrical and floating. Common mode rejection is above 80dB. Transmission to the PC-card is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

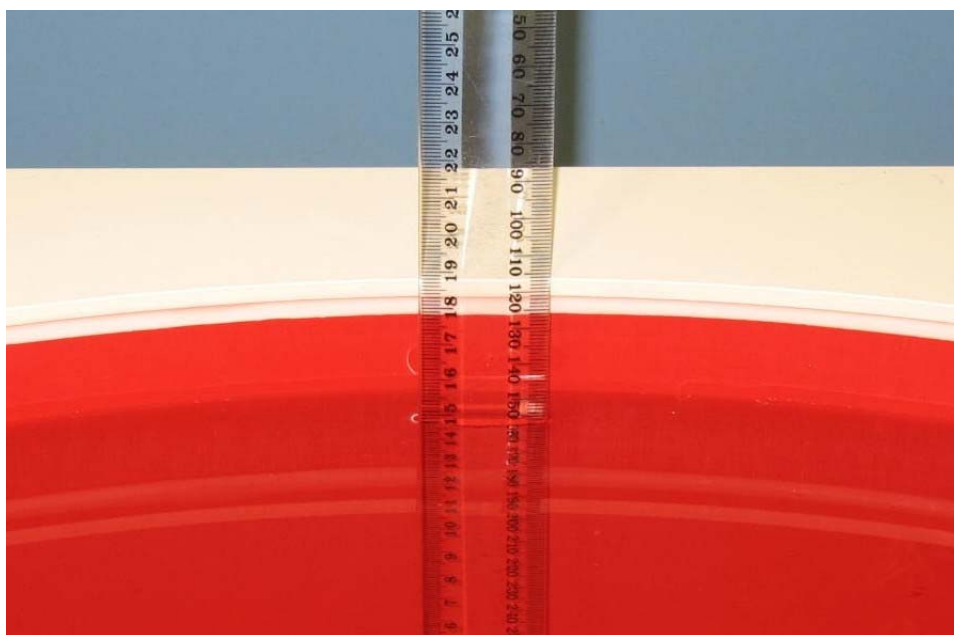
The mechanical probe-mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

Device Holder for Laptops and P 10.1 Phantom

A low loss clamp was used to position the DUT underneath the phantom surface.
Refer to Appendix A for photographs of device positioning

Liquid Depth 15cm

During the SAR measurement process the liquid level was maintained to a level of 15cm with a tolerance of 0.5cm.



Photograph Number 18.

Photo of liquid Depth in Flat Phantom

Phantom Properties

The phantom used during the testing complies with the IEEE 1528 and EN62209-1 and EN62209-2 SAR measurement requirements.

Table 17 Phantom Properties

Phantom Properties	
Depth of Phantom	19 cm
Width of flat section	40 cm
Length of flat section	60 cm
Thickness of flat section	2.0mm +/-0.2mm (flat section)
Dielectric Constant	<5.0
Loss Tangent	<0.05



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Tissue Material Properties

The dielectric parameters of the brain simulating liquid were measured prior to SAR assessment using the HP85070A dielectric probe kit and HP8753ES Network Analyser. The actual dielectric parameters are shown in the following table.

Table 18 Target Body Simulating Liquid Dielectric Values for 5200MHz range

Frequency Band	ϵ_r (target)	σ (target)	ρ kg/m ³
5180 MHz Body	49.0 $\pm$ 5%	5.3 $\pm$ 5%	1000
5240 MHz Body	48.9 $\pm$ 5%	5.4 $\pm$ 5%	1000
5260 MHz Body	48.9 $\pm$ 5%	5.4 $\pm$ 5%	1000
5320 MHz Body	48.8 $\pm$ 5%	5.4 $\pm$ 5%	1000

Table 19 Target Body Simulating Liquid Dielectric Values for 5600MHz range

Frequency Band	ϵ_r (target)	σ (target)	ρ kg/m ³
5520 MHz Body	48.6 $\pm$ 5%	5.6 $\pm$ 5%	1000
5580 MHz Body	48.5 $\pm$ 5%	5.77 $\pm$ 5%	1000
5620 MHz Body	48.5 $\pm$ 5%	5.77 $\pm$ 5%	1000
5680 MHz Body	48.4 $\pm$ 5%	5.9 $\pm$ 5%	1000

Table 20 Target Body Simulating Liquid Dielectric Values for 5800MHz range

Frequency Band	ϵ_r (target)	σ (target)	ρ kg/m ³
5745 MHz Body	48.3 $\pm$ 5%	5.9 $\pm$ 5%	1000
5785 MHz Body	48.2 $\pm$ 5%	6.0 $\pm$ 5%	1000
5825 MHz Body	48.2 $\pm$ 5%	6.0 $\pm$ 5%	1000

NOTE: The muscle liquid parameters were within the required tolerances of $\pm$ 5% for σ for ϵ_r

Simulated Tissue Composition Used for SAR Test

The tissue simulating liquids are created prior to the SAR evaluation and often require slight modification each day to obtain the correct dielectric parameters.

Table 21 Tissue Type: Muscle @ 5600MHz

EMCT Liquid, Volume of Liquid: 60 Litres

Approximate Composition	% By Weight
Distilled Water	77.5
Salt	0.3
Triton X-100	22.2



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