

APPENDIX B: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ε can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{\left[\ln(b/a)\right]^2} \int_a^b \int_0^a \int_0^{\pi} \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + {\rho'}^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $\dot{j} = \sqrt{-1}$.

3 Composition / Information on ingredients

Ethanediol	>1.0-4.9%
STOT RE 2, H373;	
Acute Tox. 4, H302	
Sodium petroleum sulfonate	< 2.9%
Eye Irrit. 2, H319	
Hexylene Glycol / 2-Methyl-pentane-2,4-diol	< 2.9%
Skin Irrit. 2, H315; Eye Irrit. 2, H319	
Alkoxylated alcohol, > C ₁₆	< 2.0%
Aquatic Chronic 2, H411;	
Skin Irrit. 2, H315; Eye Irrit. 2, H319	
	STOT RE 2, H373; Acute Tox. 4, H302 Sodium petroleum sulfonate Eye Irrit. 2, H319 Hexylene Glycol / 2-Methyl-pentane-2,4-diol Skin Irrit. 2, H315; Eye Irrit. 2, H319 Alkoxylated alcohol, > C16 Aquatic Chronic 2, H411;

Additional information: For the wording of the listed risk phrases refer to section 16.

Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential. The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure B -19-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

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	DUT Type:		APPENDIX B:
	Portable Handset		Page 1 of 2
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Measurement Certificate / Material Test

Item Name	Body Tissue Simulating Liquid (MBBL600-6000V6)	
Product No.	SL AAM U16 BC (Batch: 210621-3)	
Manufacturer	SPEAG	

Measurement Method TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

Ambient Condition 22°C ; 30% humidity TSL Temperature 22°C Test Date 23-Jun-21 Operator WM Additional Information TSL Density

TSL Heat-capacity

Results

	Measured Target		t	Diff.to Target [%]		15.0	_	-			1000				
[MHz]	e'	e"	sigma	eps	sigma	∆-eps	∆-sigma	10.0				222			
600	55.7	26.7	0.89	56.1	0.95	-0.7	-6.3	% 5.0							
750	55.3	22.5	0.94	55.5	0.96	-0.4	-2.1	0.0 2.0							
800	55.1	21.5	0.96	55.3	0.97	-0.4	-1.0	-5.0							-
825	55.1	21.1	0.97	55.2	0.98	-0.3	-1.0								
835	55.1	20.8	0.97	55.1	0.99	0.0	-1.5	-10.0	1	11.11	111				
850	55.0	20.6	0.97	55.2	0.99	-0.3	-2.0	-15.0	500	1500	2500	3500	4500	550	0
900	54.9	19.9	0.99	55.0	1.05	-0.2	-5.7			1500	Freque	3500 ency MHz	4000		
1400	54.1	15.9	1.24	54.1	1.28	0.0	-3.1	15.0							-
1450	54.0	15.7	1.27	54.0	1.30	0.0	-2.3	10.0		10.00		0.00182			_
1600	53.8	15.3	1.36	53.8	1.39	0.0	-2.2	%		1					-
1625	53.8	15.2	1.38	53.8	1.41	0.1	-2.1	0.0 0.0 0.2		/	1			/	-
1640	53.8	15.2	1.39	53.7	1.42	0.1	-2.1	onpu	Λ	~	1		/		
1650	53.7	15.1	1.39	53.7	1.43	0.0	-2.8	5.0 O	10			-			
1700	53.7	15.0	1.42	53.6	1.46	0.3	-2.7	2-10.0	-	민식민사람	int and	1.5 6.	1.0	1.21	
1750	53.6	14.9	1.45	53.4	1.49	0.3	-2.7	-15.0	500	1500	2500	3500	4500	550	0
1800	53.5	14.9	1.49	53.3	1.52	0.4	-2.0		500	1500	Freque	3500 ncy MHz	4300	550	
1810	53.5	14.9	1.50	53.3	1.52	0.4	-1.3	3500	50.9	15.9	3.10	51.3	3.31	-0.9	
1825	53.5	14.8	1.51	53.3	1.52	0.4	-0.7	3700	50.6	16.2	3.33	51.1	3.55	-1.0	3
1850	53.5	14.8	1.52	53.3	1.52	0.4	0.0	5200	47.7	18.6	5.39	49.0	5.30	-2.6	
1900	53.4	14.8	1.56	53.3	1.52	0.2	2.6	5250	47.6	18.7	5.46	49.0	5.36	-2.7	3
1950	53.4	14.7	1.60	53.3	1.52	0.2	5.3	5300	47.5	18.8	5.54	48.9	5.42	-2.8	4
2000	53.3	14.7	1.63	53.3	1.52	0.0	7.2	5500	47.1	19.1	5.83	48.6	5.65	-3.0	1
2050	53.3	14.7	1.67	53.2	1.57	0.1	6.4	5600	46.9	19.2	5.98	48.5	5.77	-3.2	- 3
2100	53.2	14.7	1.71	53.2	1.62	0.1	5.6	5700	46.7	19.3	6.13	48.3	5.88	-3.3	3
2150	53.1	14.7	1.75	53.1	1.66	0.0	5.4	5800	46.5	19.4	6.27	48.2	6.00	-3.5	1
2200	53.1	14.7	1.80	53.0	1.71	0.1	5.3	6000	46.1	19.7	6.57	47.9	6.23	-3.7	
2250	53.0	14.7	1.84	53.0		0.1	4.5	6500							
2300	52.9	14.7	1.88	52.9		0.0	3.9	7000							
2350	52.9	14.8	1.93	52.8		0.1	4.3	7500	- 24		1				
2400	52.8	14.8	1.98	52.8		0.1	4.2	8000			12014				
2450	52.7	14.8	2.02	52.7		0.0	3.6	8500							
2500	52.6	14.9	2.07	52.6		-0.1	2.5	9000							
2550	52.5	14.9	2.12	52.6		-0.1	1.4	9500							
2600	52.5	15.0	2.16	52.5		0.0	0.0	10000							

Figure B-19-2 600 - 5800 MHz Body Tissue Equivalent Matter

FCC ID: A3LSMF936U	PART 2 RF EXPOSURE EVALUATION REPORT	Approved by:			
FCC ID: A3LSIMF9360		Technical Manager			
DUT Type:	ЈТ Туре:				
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