

APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) 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):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

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 $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures

Description: Aqueous solution with surfactants and inhibitors

Declarable, or hazardous components:

| | | |
|--|---|-----------|
| CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000 | Ethanediol STOT RE 2, H373; Acute Tox. 4, H302 | >1.0-4.9% |
| CAS: 68608-26-4 EINECS: 271-781-5 Reg.nr.: 01-2119527859-22-0000 | Sodium petroleum sulfonate Eye Irrit. 2, H319 | < 2.9% |
| CAS: 107-41-5 EINECS: 203-489-0 Reg.nr.: 01-2119539582-35-0000 | Hexylene Glycol / 2-Methyl-pentane-2,4-diol Skin Irrit. 2, H315; Eye Irrit. 2, H319 | < 2.9% |
| CAS: 68920-66-1 NLP: 500-236-9 Reg.nr.: 01-2119489407-26-0000 | Alkoxyated alcohol, > C₁₆ Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319 | < 2.0% |

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 D-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.

| | | |
|-------------------------------|-----------------------|-----------------------------------|
| FCC ID A3LSMS918U | SAR EVALUATION REPORT | Approved by: Technical Manager |
| DUT Type: Portable Handset | | APPENDIX D: Page 1 of 2 |

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

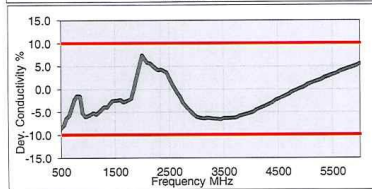
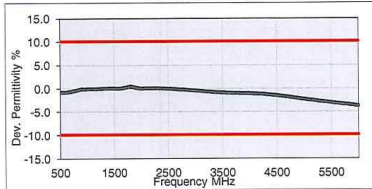
Ambient Condition 22°C ; 30% humidity
 TSL Temperature 22°C
 Test Date 23-Jun-21
 Operator WM

Additional Information

TSL Density
 TSL Heat-capacity

Results

| f [MHz] | Measured | | | Target | | Diff.to Target [%] | |
|---------|----------|------|-------|--------|-------|--------------------|---------|
| | e' | e'' | sigma | eps | sigma | Δ-eps | Δ-sigma |
| 600 | 55.7 | 26.7 | 0.89 | 56.1 | 0.95 | -0.7 | -6.3 |
| 750 | 55.3 | 22.5 | 0.94 | 55.5 | 0.96 | -0.4 | -2.1 |
| 800 | 55.1 | 21.5 | 0.96 | 55.3 | 0.97 | -0.4 | -1.0 |
| 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 |
| 850 | 55.0 | 20.6 | 0.97 | 55.2 | 0.99 | -0.3 | -2.0 |
| 900 | 54.9 | 19.9 | 0.99 | 55.0 | 1.05 | -0.2 | -5.7 |
| 1400 | 54.1 | 15.9 | 1.24 | 54.1 | 1.28 | 0.0 | -3.1 |
| 1450 | 54.0 | 15.7 | 1.27 | 54.0 | 1.30 | 0.0 | -2.3 |
| 1600 | 53.8 | 15.3 | 1.36 | 53.8 | 1.39 | 0.0 | -2.2 |
| 1625 | 53.8 | 15.2 | 1.38 | 53.8 | 1.41 | 0.1 | -2.1 |
| 1640 | 53.8 | 15.2 | 1.39 | 53.7 | 1.42 | 0.1 | -2.1 |
| 1650 | 53.7 | 15.1 | 1.39 | 53.7 | 1.43 | 0.0 | -2.8 |
| 1700 | 53.7 | 15.0 | 1.42 | 53.6 | 1.46 | 0.3 | -2.7 |
| 1750 | 53.6 | 14.9 | 1.45 | 53.4 | 1.49 | 0.3 | -2.7 |
| 1800 | 53.5 | 14.9 | 1.49 | 53.3 | 1.52 | 0.4 | -2.0 |
| 1810 | 53.5 | 14.9 | 1.50 | 53.3 | 1.52 | 0.4 | -1.3 |
| 1825 | 53.5 | 14.8 | 1.51 | 53.3 | 1.52 | 0.4 | -0.7 |
| 1850 | 53.5 | 14.8 | 1.52 | 53.3 | 1.52 | 0.4 | 0.0 |
| 1900 | 53.4 | 14.8 | 1.56 | 53.3 | 1.52 | 0.2 | 2.6 |
| 1950 | 53.4 | 14.7 | 1.60 | 53.3 | 1.52 | 0.2 | 5.3 |
| 2000 | 53.3 | 14.7 | 1.63 | 53.3 | 1.52 | 0.0 | 7.2 |
| 2050 | 53.3 | 14.7 | 1.67 | 53.2 | 1.57 | 0.1 | 6.4 |
| 2100 | 53.2 | 14.7 | 1.71 | 53.2 | 1.62 | 0.1 | 5.6 |
| 2150 | 53.1 | 14.7 | 1.75 | 53.1 | 1.66 | 0.0 | 5.4 |
| 2200 | 53.1 | 14.7 | 1.80 | 53.0 | 1.71 | 0.1 | 5.3 |
| 2250 | 53.0 | 14.7 | 1.84 | 53.0 | 1.76 | 0.1 | 4.5 |
| 2300 | 52.9 | 14.7 | 1.88 | 52.9 | 1.81 | 0.0 | 3.9 |
| 2350 | 52.9 | 14.8 | 1.93 | 52.8 | 1.85 | 0.1 | 4.3 |
| 2400 | 52.8 | 14.8 | 1.98 | 52.8 | 1.90 | 0.1 | 4.2 |
| 2450 | 52.7 | 14.8 | 2.02 | 52.7 | 1.95 | 0.0 | 3.6 |
| 2500 | 52.6 | 14.9 | 2.07 | 52.6 | 2.02 | -0.1 | 2.5 |
| 2550 | 52.5 | 14.9 | 2.12 | 52.6 | 2.09 | -0.1 | 1.4 |
| 2600 | 52.5 | 15.0 | 2.16 | 52.5 | 2.16 | 0.0 | 0.0 |



| | | | | | | | |
|-------|------|------|------|------|------|------|------|
| 3500 | 50.9 | 15.9 | 3.10 | 51.3 | 3.31 | -0.9 | -6.3 |
| 3700 | 50.6 | 16.2 | 3.33 | 51.1 | 3.55 | -1.0 | -6.2 |
| 5200 | 47.7 | 18.6 | 5.39 | 49.0 | 5.30 | -2.6 | 1.7 |
| 5250 | 47.6 | 18.7 | 5.46 | 49.0 | 5.36 | -2.7 | 1.9 |
| 5300 | 47.5 | 18.8 | 5.54 | 48.9 | 5.42 | -2.8 | 2.2 |
| 5500 | 47.1 | 19.1 | 5.83 | 48.6 | 5.65 | -3.0 | 3.2 |
| 5600 | 46.9 | 19.2 | 5.98 | 48.5 | 5.77 | -3.2 | 3.6 |
| 5700 | 46.7 | 19.3 | 6.13 | 48.3 | 5.88 | -3.3 | 4.2 |
| 5800 | 46.5 | 19.4 | 6.27 | 48.2 | 6.00 | -3.5 | 4.6 |
| 6000 | 46.1 | 19.7 | 6.57 | 47.9 | 6.23 | -3.7 | 5.5 |
| 6500 | | | | | | | |
| 7000 | | | | | | | |
| 7500 | | | | | | | |
| 8000 | | | | | | | |
| 8500 | | | | | | | |
| 9000 | | | | | | | |
| 9500 | | | | | | | |
| 10000 | | | | | | | |

Figure D-2
600 – 6000 MHz Body Tissue Equivalent Matter

| | | |
|-------------------------------|------------------------------|--|
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| DUT Type: Portable Handset | | APPENDIX D: Page 2 of 2 |