

APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system were 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 | Alkoxylated 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: BCG-A3055 | SAR EVALUATION REPORT | Approved by: Technical Manager |
| DUT Type: Wireless Earbud | | APPENDIX D: Page 1 of 2 |

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s p e a g

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Measurement Certificate / Material Test

| | |
|--------------|---|
| Item Name | Head Tissue Simulating Liquid (HBBL600-10000V6) |
| Product No. | SL AAH U16 BC (Batch: 230313-2) |
| Manufacturer | SPEAG |

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

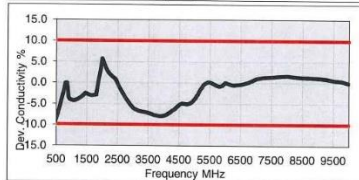
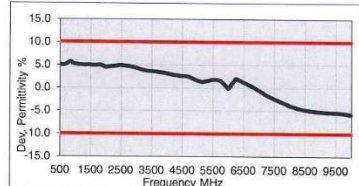
Ambient Condition 22°C ; 30% humidity
TSL Temperature 22°C
Test Date 17-Mar-23
Operator WM

Additional Information

TSL Density
TSL Heat-capacity

Results

| f [MHz] | Measured | | | Target | | | Diff. to Target [%] | |
|---------|-------------|--------------|-------|--------|-------|--|---------------------|----------------|
| | ϵ' | ϵ'' | sigma | eps | sigma | | $\Delta\epsilon$ | $\Delta\sigma$ |
| 600 | 44.9 | 24.8 | 0.83 | 42.7 | 0.88 | | 5.1 | -5.9 |
| 750 | 44.2 | 21.0 | 0.88 | 41.9 | 0.89 | | 5.4 | -1.5 |
| 800 | 44.0 | 20.1 | 0.90 | 41.7 | 0.90 | | 5.6 | 0.3 |
| 825 | 44.0 | 19.8 | 0.91 | 41.6 | 0.91 | | 5.8 | 0.4 |
| 835 | 44.0 | 19.6 | 0.92 | 41.5 | 0.91 | | 5.9 | 0.9 |
| 850 | 43.9 | 19.4 | 0.92 | 41.5 | 0.92 | | 5.8 | 0.4 |
| 900 | 43.7 | 18.7 | 0.94 | 41.5 | 0.97 | | 5.3 | -3.1 |
| 1400 | 42.6 | 14.7 | 1.15 | 40.6 | 1.18 | | 4.9 | -2.5 |
| 1450 | 42.5 | 14.5 | 1.17 | 40.5 | 1.20 | | 4.9 | -2.5 |
| 1600 | 42.3 | 14.0 | 1.25 | 40.3 | 1.28 | | 4.9 | -2.7 |
| 1625 | 42.3 | 13.9 | 1.26 | 40.3 | 1.30 | | 5.0 | -3.0 |
| 1640 | 42.3 | 13.9 | 1.27 | 40.3 | 1.31 | | 5.1 | -2.8 |
| 1650 | 42.2 | 13.9 | 1.27 | 40.2 | 1.31 | | 4.9 | -3.3 |
| 1700 | 42.1 | 13.8 | 1.30 | 40.2 | 1.34 | | 4.8 | -3.1 |
| 1750 | 42.1 | 13.7 | 1.33 | 40.1 | 1.37 | | 5.0 | -3.0 |
| 1800 | 42.0 | 13.6 | 1.36 | 40.0 | 1.40 | | 5.0 | -2.9 |
| 1810 | 42.0 | 13.6 | 1.37 | 40.0 | 1.40 | | 5.0 | -2.1 |
| 1825 | 42.0 | 13.5 | 1.38 | 40.0 | 1.40 | | 5.0 | -1.4 |
| 1850 | 42.0 | 13.5 | 1.39 | 40.0 | 1.40 | | 5.0 | -0.7 |
| 1900 | 41.9 | 13.4 | 1.42 | 40.0 | 1.40 | | 4.7 | 1.4 |
| 1950 | 41.8 | 13.4 | 1.45 | 40.0 | 1.40 | | 4.5 | 3.6 |
| 2000 | 41.8 | 13.3 | 1.48 | 40.0 | 1.40 | | 4.5 | 5.7 |
| 2050 | 41.7 | 13.3 | 1.51 | 39.9 | 1.44 | | 4.5 | 4.5 |
| 2100 | 41.7 | 13.2 | 1.55 | 39.8 | 1.49 | | 4.7 | 4.1 |
| 2150 | 41.6 | 13.2 | 1.58 | 39.7 | 1.53 | | 4.7 | 3.0 |
| 2200 | 41.5 | 13.2 | 1.62 | 39.6 | 1.58 | | 4.7 | 2.7 |
| 2250 | 41.4 | 13.2 | 1.65 | 39.6 | 1.62 | | 4.7 | 1.7 |
| 2300 | 41.3 | 13.2 | 1.69 | 39.5 | 1.67 | | 4.6 | 1.4 |
| 2350 | 41.3 | 13.3 | 1.73 | 39.4 | 1.71 | | 4.9 | 1.1 |
| 2400 | 41.2 | 13.3 | 1.77 | 39.3 | 1.76 | | 4.9 | 0.8 |
| 2450 | 41.1 | 13.3 | 1.81 | 39.2 | 1.80 | | 4.8 | 0.6 |
| 2500 | 41.1 | 13.3 | 1.85 | 39.1 | 1.85 | | 5.0 | -0.2 |
| 2550 | 41.0 | 13.3 | 1.89 | 39.1 | 1.91 | | 4.9 | -1.0 |
| 2600 | 40.9 | 13.4 | 1.93 | 39.0 | 1.96 | | 4.8 | -1.7 |



| | | | | | | | |
|-------|------|------|-------|------|-------|------|------|
| 3500 | 39.3 | 13.9 | 2.70 | 37.9 | 2.91 | 3.6 | -7.2 |
| 3700 | 39.0 | 14.0 | 2.88 | 37.7 | 3.12 | 3.4 | -7.7 |
| 5200 | 36.5 | 15.8 | 4.58 | 36.0 | 4.66 | 1.3 | -1.5 |
| 5250 | 36.4 | 16.0 | 4.66 | 35.9 | 4.71 | 1.4 | -1.0 |
| 5300 | 36.4 | 16.1 | 4.73 | 35.9 | 4.76 | 1.5 | -0.5 |
| 5500 | 36.3 | 16.2 | 4.97 | 35.6 | 4.96 | 1.8 | 0.1 |
| 5600 | 36.2 | 16.2 | 5.06 | 35.5 | 5.07 | 1.8 | -0.2 |
| 5700 | 36.0 | 16.2 | 5.14 | 35.4 | 5.17 | 1.6 | -0.6 |
| 5800 | 35.7 | 16.2 | 5.22 | 35.3 | 5.27 | 1.2 | -0.9 |
| 6000 | 35.0 | 16.4 | 5.48 | 35.1 | 5.48 | -0.2 | 0.1 |
| 6500 | 34.9 | 16.7 | 6.05 | 34.5 | 6.07 | 1.2 | -0.4 |
| 7000 | 33.7 | 17.2 | 6.72 | 33.9 | 6.65 | -0.6 | 1.0 |
| 7500 | 32.5 | 17.6 | 7.34 | 33.3 | 7.24 | -2.5 | 1.4 |
| 8000 | 31.4 | 17.9 | 7.97 | 32.7 | 7.84 | -3.9 | 1.7 |
| 8500 | 30.6 | 18.1 | 8.57 | 32.1 | 8.45 | -4.8 | 1.3 |
| 9000 | 29.9 | 18.3 | 9.18 | 31.5 | 9.08 | -5.2 | 1.2 |
| 9500 | 29.3 | 18.5 | 9.77 | 31.0 | 9.71 | -5.4 | 0.6 |
| 10000 | 28.6 | 18.6 | 10.35 | 30.4 | 10.36 | -5.9 | -0.1 |

Figure D-2
600 – 10000 MHz Head Tissue Equivalent Matter

| | | |
|------------------------------|-----------------------|-----------------------------------|
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