APPENDIX C: 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 ɛ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_{r}\varepsilon_{0}}{[\ln(b/a)]^{2}} \int_{a}^{b} \int_{a}^{b} \int_{0}^{\pi} \cos\phi' \frac{\exp[-j\omega r(\mu_{0}\varepsilon_{r}^{'}\varepsilon_{0})^{1/2}]}{r} d\phi' d\rho' d\rho$$

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 Declarable, or hazardous compon		
CAS: 107-21-1	Ethanediol	>1.0-4.9%
EINECS: 203-473-3	STOT RE 2, H373;	
Reg.nr.: 01-2119456816-28-0000	Acute Tox. 4, H302	
CAS: 68608-26-4	Sodium petroleum sulfonate	< 2.9%
EINECS: 271-781-5	Eye Irrit. 2, H319	
Reg.nr.: 01-2119527859-22-0000		
CAS: 107-41-5	Hexylene Glycol / 2-Methyl-pentane-2,4-diol	< 2.9%
EINECS: 203-489-0	Skin Irrit. 2, H315; Eye Irrit. 2, H319	
Reg.nr.: 01-2119539582-35-0000		
CAS: 68920-66-1	Alkoxylated alcohol, > C ₁₆	< 2.0%
NLP: 500-236-9	Aquatic Chronic 2, H411;	
Reg.nr.: 01-2119489407-26-0000	Skin Irrit. 2, H315; Eye Irrit. 2, H319	
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 C-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 A3LSMN981W	PCTEST Provad to be part of @ element	SAR EVALUATION REPORT	SAMSUNG	Approved by: Quality Manager
	Test Dates:	DUT Type:			APPENDIX C:
	06/03/20 - 07/13/20	Portable Handset			Page 1 of 3
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Schmid & Partner Engineering AG S peag

Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 44 245 9700, Fax +41 44 245 9779 info@speag.com, http://www.speag.com

Measurement Certificate / Material Test

Item Name	Body Tissue Simulating Liquid (MBBL600-6000V6)
Product No.	SL AAM U16 BC (Batch: 181029-1)
Manufacturer	SPEAG

Measurement Method TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters Target parameters as defined in the KDB 865664 compliance standard.

Ambient Condi	tion 22°C ; 30% humidity	
TSL Temperat	ure 22°C	
Test Date	30-Oct-18	
Operator	CL	
Additional Inf	ormation	
TSL Density		
TSL Heat-capa	city	

Results

Т

	Measu	ured		Targe	t	Diff.to Targ	get [%]							
f [MHz]	e	e"	sigma	eps	sigma	∆-eps	∆-sigma	15.0		155 B		124		
800	55.1	21.3	0.95	55.3	0.97	-0.4	-2.1	10.0	141	1.00			100	
825	55.1	20.8	0.96	55.2	0.98	-0.3	-2.0							
835	55.1	20.6	0.96	55.1	0.99	0.0	-2.5	≈ 5.0						
850	55.1	20.4	0.96	55.2	0.99	-0.1	-3.0	0.0 -5.0			1.1.1			
900	55.0	19.7	0.98	55.0	1.05	0.0	-6.7	in in it						-
1400	54.2	15.6	1.22	54.1	1.28	0.2	-4.7	a -5.0						
1450	54.1	15.4	1.24	54.0	1.30	0.2	-4.6	-10.0			1000 10 P			
1500	54.1	15.3	1.27	53.9	1.33	0.3	-4.5							
1550	54.0	15.1	1.30	53.9	1.36	0.2	-4.4	-15.0 500	1500	2500	3500	4500	550	00
1600	53.9	15.0	1.33	53.8	1.39	0.2	-4.3		1000		ency MHz	1000	000	
1625	53.9	14.9	1.35	53.8	1.41	0.3	-4.3							
1640	53.9	14.9	1.36	53.7	1.42	0.3	-4.2	45.0						
1650	53.8	14.9	1.36	53.7	1.43	0.2	-4.9	15.0						
1700	53.8	14.8	1.40	53.6	1.46	0.4	-4.1	10.0						
1750	53.7	14.7	1.43	53.4	1.49	0.5	-4.0	8 50						
1800	53.7	14.6	1.46	53.3	1.52	0.8	-3.9	6, 200	1. S. S. S.	N				1
1810	53.7	14.6	1.47	53.3	1.52	0.8	-3.3	0.0 Conductivity		1			/	-
1825	53.7	14.6	1.48	53.3	1.52	0.8	-2.6	8 -5.0 -		1		/		
1850	53.6	14.5	1.50	53.3	1.52	0.6	-1.3		w	•		/		
1900	53.5	14.5	1.53	53.3	1.52	0.4	0.7	-10.0		6 N 4 58	~			_
1300					1.52	0.4	3.3	100						
1950	53.5	14.5	1.57	53.3	1.02		3.3	45.0						
	53.5 53.4	14.5 14.4	1.57 1.60	53.3	1.52	0.2	5.3	-15.0 500	1500	2500	3500	4500	550	0
1950	0.0000000								1500		3500 ncy MHz	4500	550	0
1950 2000	53.4	14.4	1.60	53.3	1.52	0.2	5.3		1500			4500	550	0
1950 2000 2050	53.4 53.4	14.4 14.4	1.60 1.64	53.3 53.2	1.52 1.57	0.2 0.3	5.3 4.5		1500			4500	550	0
1950 2000 2050 2100	53.4 53.4 53.3	14.4 14.4 14.4	1.60 1.64 1.68	53.3 53.2 53.2	1.52 1.57 1.62	0.2 0.3 0.2	5.3 4.5 3.7					4500	-0.4	
1950 2000 2050 2100 2150	53.4 53.4 53.3 53.3	14.4 14.4 14.4 14.4	1.60 1.64 1.68 1.72	53.3 53.2 53.2 53.1	1.52 1.57 1.62 1.66	0.2 0.3 0.2 0.4	5.3 4.5 3.7 3.6	500	.1 15.5	Frequer	ncy MHz			
1950 2000 2050 2100 2150 2200	53.4 53.4 53.3 53.3 53.2	14.4 14.4 14.4 14.4 14.4	1.60 1.64 1.68 1.72 1.76	53.3 53.2 53.2 53.1 53.0	1.52 1.57 1.62 1.66 1.71	0.2 0.3 0.2 0.4 0.3	5.3 4.5 3.7 3.6 2.9	500 3500 51	.1 15.5 .8 15.7	Frequer	51.3	3.31	-0.4	
1950 2000 2050 2100 2150 2200 2250	53.4 53.4 53.3 53.3 53.2 53.1	14.4 14.4 14.4 14.4 14.4 14.4	1.60 1.64 1.68 1.72 1.76 1.81	53.3 53.2 53.2 53.1 53.0 53.0	1.52 1.57 1.62 1.66 1.71 1.76	0.2 0.3 0.2 0.4 0.3 0.2	5.3 4.5 3.7 3.6 2.9 2.8	500 3500 51 3700 50	.1 15.5 .8 15.7 .1 18.2	3.02 3.24	51.3 51.1	3.31 3.55	-0.4 -0.5	1 1
1950 2000 2050 2100 2150 2200 2250 2300	53.4 53.4 53.3 53.3 53.2 53.1 53.1	14.4 14.4 14.4 14.4 14.4 14.4 14.4	1.60 1.64 1.68 1.72 1.76 1.81 1.85	53.3 53.2 53.2 53.1 53.0 53.0 53.0 52.9	1.52 1.57 1.62 1.66 1.71 1.76 1.81	0.2 0.3 0.2 0.4 0.3 0.2 0.2 0.4	5.3 4.5 3.7 3.6 2.9 2.8 2.2	500 3500 51 3700 50 5200 48	.1 15.5 .8 15.7 .1 18.2 .0 18.3	3.02 3.24 5.27	51.3 51.1 49.0	3.31 3.55 5.30	-0.4 -0.5 -1.8	1 1 1
1950 2000 2050 2100 2150 2200 2250 2300 2350	53.4 53.3 53.3 53.2 53.1 53.1 53.0	14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.5	1.60 1.64 1.68 1.72 1.76 1.81 1.85 1.89	53.3 53.2 53.2 53.1 53.0 53.0 52.9 52.8	1.52 1.57 1.62 1.66 1.71 1.76 1.81 1.85	0.2 0.3 0.2 0.4 0.3 0.2 0.4 0.4 0.3	5.3 4.5 3.7 3.6 2.9 2.8 2.2 2.2	500 3500 51 3700 500 5200 48 5250 48	.1 15.5 .8 15.7 .1 18.2 .0 18.3 .9 18.4	3.02 3.24 5.27 5.34	51.3 51.1 49.0 49.0	3.31 3.55 5.30 5.36	-0.4 -0.5 -1.8 -1.9	7 7 7 7 7
1950 2000 2150 2100 2250 2250 2300 2350 2400	53.4 53.3 53.3 53.2 53.1 53.1 53.0 52.9	14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.5 14.5	1.60 1.64 1.68 1.72 1.76 1.81 1.85 1.89 1.94	53.3 53.2 53.2 53.1 53.0 53.0 52.9 52.8 52.8	1.52 1.57 1.62 1.66 1.71 1.76 1.81 1.85 1.90	0.2 0.3 0.2 0.4 0.3 0.2 0.4 0.4 0.3 0.2	5.3 4.5 3.7 3.6 2.9 2.8 2.2 2.2 2.2 2.1	500 3500 51 3700 50 5200 48 5250 48 5300 47	.1 15.5 .8 15.7 .1 18.2 .0 18.3 .9 18.4 .5 18.6	3.02 3.24 5.27 5.34 5.41	51.3 51.1 49.0 48.9	3.31 3.55 5.30 5.36 5.42	-0.4 -0.5 -1.8 -1.9 -2.0	 - - -
1950 2000 2150 2150 2200 2250 2350 2350 2400 2450	53.4 53.4 53.3 53.2 53.1 53.1 53.1 53.0 52.9 52.9	14.4 14.4 14.4 14.4 14.4 14.4 14.4 14.5 14.5	1.60 1.64 1.68 1.72 1.76 1.81 1.85 1.89 1.94 1.98	53.3 53.2 53.2 53.1 53.0 53.0 52.9 52.8 52.8 52.8	1.52 1.57 1.62 1.66 1.71 1.76 1.81 1.85 1.90 1.95	0.2 0.3 0.2 0.4 0.3 0.2 0.4 0.3 0.2 0.4 0.3 0.2	5.3 4.5 3.7 3.6 2.9 2.8 2.2 2.2 2.1 1.5	3500 51 3700 50 5200 48 5250 48 5300 47 5500 47	.1 15.5 8 15.7 .1 18.2 .0 18.3 .9 18.4 .5 18.6 .3 18.8	3.02 3.24 5.27 5.34 5.41 5.70	51.3 51.1 49.0 48.9 48.6	3.31 3.55 5.30 5.36 5.42 5.65	-0.4 -0.5 -1.8 -1.9 -2.0 -2.2	0

TSL Dielectric Parameters

Figure C-2 600 – 5800 MHz Body Tissue Equivalent Matter

-0.4 -8.8 -0.5 -8.8

0.8 -2.3 -2.5 5.77

1.3

1.8

-1.9 -2.0 -0.4 -0.2

3.31 3.55 5.30 -1.8 -0.6

	FCC ID A3LSMN981W	PCTEST Proced to be part of the element	SAR EVALUATION REPORT	SAMSUNG	Approved by: Quality Manager
	Test Dates:	DUT Type:			APPENDIX C:
	06/03/20 - 07/13/20	Portable Handset			Page 2 of 3
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Schmid & Partner Engineering AG	S	p	е	а	g	
Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 44 245 9700, Fax +41 44 245 9779 info@speag.com, http://www.speag.com						

Measurement Certificate / Material Test

Item Name	Head Tissue Simulating Liquid (HBBL600-10000V6)	
Product No.	SL AAH U16 BC (Batch: 181031-2)	
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.

Ambient Conditi	on 22°C ; 30% humidity	
TSL Temperatu		
Test Date	31-Oct-18	
Operator	CL	
Additional Info	rmation	
TSL Density		
TSL Heat-capac	ity	

Results

	Meas	ured	1 million	Targe	et	Diff.to Targ	get [%]	15.4							
f [MHz]	e'	e"	sigma	eps	sigma	∆-eps	∆-sigma	15.0		1.31		1223		18182	
800	43.8	20.5	0.91	41.7	0.90	5.1	1.4	10.0	0			-	all and		
825	43.8	20.1	0.92	41.6	0.91	5.3	1.5	2º 5.0		-					
835	43.8	19.9	0.93	41.5	0.91	5.4	2.0	UIII				-			
850	43.7	19.7	0.93	41.5	0.92	5.3	1.5	E					/		
900	43.5	18.9	0.95	41.5	0.97	4.8	-2.1							-	-
1400	42.5	15.0	1.17	40.6	1.18	4.7	-0.8	Q-10.0)						-
1450	42.5	14.8	1.19	40.5	1.20	4.9	-0.8	-15.0)	14		12-11-2		2012	
1600	42.2	14.3	1.27	40.3	1.28	4.7	-1.1		500 15	00 2500		500 5500 Incy MHz	6500 7500	0 8500 9	9500
1625	42.2	14.2	1.29	40.3	1.30	4.8	-0.7		_		Troque	andy with iz			_
1640	42.2	14.2	1.30	40.3	1.31	4.8	-0.5	15.0		23.45	1353	0.52433		TRIS R	1
1650	42.1	14.2	1.30	40.2	1.31	4.6	-1.0	10.0							
1700	42.1	14.0	1.33	40.2	1.34	4.8	-0.9	A 5.0	-	٨					1
1750	42.0	13.9	1.36	40.1	1.37	4.8	-0.8	0.0 rctiv		$\boldsymbol{\Lambda}$		1		-	16
1800	41.9	13.9	1.39	40.0	1.40	4.7	-0.7	0.0 0.0-5.0	p	- /		/			
	1000	13.8	1.40	40.0	1.40	4.7	0.0								
1810	41.9	13.0	1.40												
1810 1825	41.9	13.8	1.41	40.0	1.40	4.7	0.7	a10.0				-			
				40.0 40.0			10.1 7.0	-15.0			1				
1825	41.9	13.8	1.41		1.40	4.7	0.7	-15.0	500 150	0 2500	3500 45 Freque	00 5500 e	500 7500	8500 9	500
1825 1850	41.9 41.8	13.8 13.8	1.41 1.42	40.0	1.40 1.40	4.7 4.5	0.7 1.4	-15.0	500 150	15.8	3500 45 Freque	00 5500 é ancy MHz 36.0			
1825 1850 1900	41.9 41.8 41.8	13.8 13.8 13.7	1.41 1.42 1.45	40.0 40.0	1.40 1.40 1.40	4.7 4.5 4.5	0.7 1.4 3.6	-15.0	_		Freque	36.0	4.66	0.9	-1
1825 1850 1900 1950	41.9 41.8 41.8 41.7	13.8 13.8 13.7 13.7	1.41 1.42 1.45 1.48	40.0 40.0 40.0	1.40 1.40 1.40 1.40	4.7 4.5 4.5 4.3	0.7 1.4 3.6 5.7	-15.0 5200	36.3	15.8	4.57	ency MHz	4.66 4.71	0.9 0.8	-1 -1
1825 1850 1900 1950 2000	41.9 41.8 41.8 41.7 41.6	13.8 13.8 13.7 13.7 13.6	1.41 1.42 1.45 1.48 1.51	40.0 40.0 40.0 40.0	1.40 1.40 1.40 1.40 1.40	4.7 4.5 4.3 4.0	0.7 1.4 3.6 5.7 7.9	-15.0 5200 5250	36.3 36.2	15.8 15.9	4.57 4.63	36.0 35.9	4.66	0.9	-1 -1
1825 1850 1900 1950 2000 2050	41.9 41.8 41.8 41.7 41.6 41.6	13.8 13.8 13.7 13.7 13.6 13.6	1.41 1.42 1.45 1.48 1.51 1.55	40.0 40.0 40.0 39.9	1.40 1.40 1.40 1.40 1.40 1.44	4.7 4.5 4.3 4.0 4.2	0.7 1.4 3.6 5.7 7.9 7.3	-15.0 5200 5250 5300	36.3 36.2 36.1	15.8 15.9 15.9	4.57 4.63 4.69	36.0 35.9 35.9	4.66 4.71 4.76	0.9 0.8 0.7	-1 -1 -1 -0
1825 1850 1900 1950 2000 2050 2100	41.9 41.8 41.7 41.6 41.6 41.6 41.5	13.8 13.7 13.7 13.6 13.6 13.5	1.41 1.42 1.45 1.48 1.51 1.55 1.58	40.0 40.0 40.0 39.9 39.8	1.40 1.40 1.40 1.40 1.40 1.44 1.49	4.7 4.5 4.3 4.0 4.2 4.2	0.7 1.4 3.6 5.7 7.9 7.3 6.1	-15.0 5200 5250 5300 5500	36.3 36.2 36.1 35.8	15.8 15.9 15.9 16.1	4.57 4.63 4.69 4.92	36.0 35.9 35.9 35.6	4.66 4.71 4.76 4.96	0.9 0.8 0.7 0.3	-1 -1 -1 -0
1825 1850 1900 1950 2000 2050 2100 2150	41.9 41.8 41.8 41.7 41.6 41.6 41.5 41.4	13.8 13.7 13.7 13.6 13.6 13.5 13.5	1.41 1.42 1.45 1.48 1.51 1.55 1.58 1.62	40.0 40.0 40.0 39.9 39.8 39.7	1.40 1.40 1.40 1.40 1.40 1.44 1.49 1.53	4.7 4.5 4.5 4.3 4.0 4.2 4.2 4.2	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7	-15.0 5200 5250 5300 5500 5600	36.3 36.2 36.1 35.8 35.6	15.8 15.9 15.9 16.1 16.2	4.57 4.63 4.69 4.92 5.04	36.0 35.9 35.9 35.6 35.5	4.66 4.71 4.76 4.96 5.07	0.9 0.8 0.7 0.3 0.1	-1 -1 -0 -0 -0
1825 1850 1900 1950 2000 2050 2100 2150 2200	41.9 41.8 41.7 41.6 41.6 41.5 41.4 41.4	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5	1.41 1.42 1.45 1.51 1.55 1.58 1.62 1.65	40.0 40.0 40.0 39.9 39.8 39.7 39.6	1.40 1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58	4.7 4.5 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.2 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6	-15.0 5200 5250 5300 5500 5500 5600 5700	36.3 36.2 36.1 35.8 35.6 35.4	15.8 15.9 15.9 16.1 16.2 16.2	4.57 4.63 4.69 4.92 5.04 5.15	36.0 35.9 35.9 35.6 35.5 35.4	4.66 4.71 4.76 4.96 5.07 5.17	0.9 0.8 0.7 0.3 0.1 0.0 -0.2	-1 -1 -0 -0 -0
1825 1850 1900 2000 2050 2100 2150 2200 2250	41.9 41.8 41.7 41.6 41.6 41.6 41.5 41.4 41.4 41.3	13.8 13.7 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5	1.41 1.42 1.45 1.48 1.51 1.55 1.58 1.62 1.65 1.69	40.0 40.0 40.0 39.9 39.8 39.7 39.6 39.6	1.40 1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58 1.62	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.2 4.4 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2	-15.0 5200 5250 5300 5500 5600 5600 5700 5800	36.3 36.2 36.1 35.8 35.6 35.4 35.2	15.8 15.9 15.9 16.1 16.2 16.2 16.3	4.57 4.63 4.69 4.92 5.04 5.15 5.27	36.0 35.9 35.6 35.5 35.4 35.3	4.66 4.71 4.76 4.96 5.07 5.17 5.27	0.9 0.8 0.7 0.3 0.1 0.0	-1 -1 -0 -0 -0 0 0
1825 1850 1900 2000 2050 2100 2150 2200 2250 2250	41.9 41.8 41.7 41.6 41.6 41.5 41.4 41.4 41.3 41.2	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.45 1.48 1.51 1.55 1.58 1.62 1.65 1.69 1.72	40.0 40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5	1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.40 1.41 1.42 1.53 1.58 1.62 1.67	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.4 4.4 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2	-15.0 5200 5250 5300 5500 5500 5600 5700 5800 6000	36.3 36.2 36.1 35.8 35.6 35.4 35.4 35.2 34.9	15.8 15.9 15.9 16.1 16.2 16.2 16.3 16.5	4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50	36.0 35.9 35.9 35.6 35.5 35.4 35.3 35.1	4.66 4.71 4.76 4.96 5.07 5.17 5.27 5.48	0.9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6	-1 -1 -0 -0 -0 0 0 0
1825 1850 1900 2000 2050 2100 2150 2200 2250 2300 2350	41.9 41.8 41.7 41.6 41.6 41.5 41.4 41.4 41.4 41.3 41.2 41.1	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.45 1.51 1.55 1.58 1.62 1.65 1.69 1.72 1.76	40.0 40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5 39.4	1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58 1.62 1.67 1.71	4.7 4.5 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.4 4.4 4.4 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2 2.9	-15.0 5200 5250 5300 5500 5600 5700 5800 6000 6500	36.3 36.2 36.1 35.8 35.6 35.4 35.2 34.9 34.0	15.8 15.9 15.9 16.1 16.2 16.2 16.3 16.5 16.9	4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50 6.12	ancy MHz 36.0 35.9 35.6 35.5 35.4 35.3 35.1 34.5	4.66 4.71 4.76 4.96 5.07 5.17 5.27 5.48 6.07	0.9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6 -1.4 -2.3	-1 -1 -0 -0 -0 0 0 0 0 1
1825 1850 1950 2000 2050 2100 2150 2200 2250 2300 2350 2350 2400	41.9 41.8 41.7 41.6 41.6 41.6 41.5 41.4 41.4 41.4 41.3 41.2 41.1 41.1	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.48 1.51 1.55 1.58 1.62 1.65 1.69 1.72 1.76 1.80 1.84	40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5 39.4 39.3	1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58 1.62 1.67 1.71 1.76	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.4 4.4 4.4 4.4 4.6	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2 2.9 2.5	-15.0 5200 5250 5300 5500 5500 5600 5800 6000 6500 7000	36.3 36.2 36.1 35.8 35.6 35.4 35.2 34.9 33.1	15.8 15.9 16.1 16.2 16.3 16.5 16.9	4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50 6.12 6.74	ancy MHz 36.0 35.9 35.9 35.6 35.5 35.4 35.3 35.1 34.5 33.9	4.66 4.71 4.76 5.07 5.17 5.27 5.48 6.07 6.65	0,9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6 -1.4	-1 -1 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0
1825 1850 1900 1950 2000 2050 2100 2150 2200 2250 2300 2350 2400 2450	41.9 41.8 41.7 41.6 41.6 41.5 41.4 41.4 41.4 41.3 41.2 41.1 41.1 41.1	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.48 1.51 1.55 1.58 1.62 1.65 1.69 1.72 1.76 1.80 1.84	40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5 39.4 39.3 39.2	1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58 1.62 1.67 1.71 1.76 1.80	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.4 4.4 4.4 4.4 4.6 4.6	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2 2.9 2.5 2.2	-15.0 5200 5250 5300 5500 5500 5600 5700 5800 6000 6500 7000 7500	36.3 36.2 36.1 35.8 35.6 35.4 35.2 34.9 34.0 33.1 32.2	15.8 15.9 16.1 16.2 16.3 16.5 16.9 17.3 17.6	Freque 4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50 6.12 6.74 7.36	ancy MHz 36.0 35.9 35.9 35.6 35.5 35.4 35.3 35.1 34.5 33.9 33.3	4.66 4.71 4.76 5.07 5.17 5.27 5.48 6.07 6.65 7.24	0.9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6 -1.4 -2.3 -3.2	-1 -1 -0 -0 -0 0 0 0 1. 1. 1.
1825 1850 1900 1950 2000 2100 2100 2150 2250 2300 2400 2450 2250	41.9 41.8 41.7 41.6 41.5 41.5 41.4 41.4 41.3 41.2 41.1 41.1 41.0 40.9	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.45 1.51 1.55 1.58 1.62 1.65 1.69 1.72 1.76 1.80 1.84 1.88 1.92	40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5 39.4 39.3 39.2 39.2	1.40 1.40 1.40 1.40 1.40 1.41 1.42 1.53 1.53 1.58 1.62 1.67 1.71 1.76 1.80	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.2 4.2 4.4 4.4 4.4 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2 2.9 2.5 2.2 1.4	-15.0 5200 5250 5300 5500 5500 5500 5700 5800 6000 6500 7000 7500 8000	36.3 36.2 36.1 35.8 35.6 35.4 35.2 34.9 34.0 33.1 32.2 31.4	15.8 15.9 15.9 16.1 16.2 16.2 16.3 16.5 16.9 17.3 17.6 17.9	Freque 4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50 6.12 6.74 7.36 7.97	ancy MHz 36.0 35.9 35.6 35.5 35.4 35.3 35.1 34.5 33.9 33.3 32.7	4.66 4.71 4.76 5.07 5.17 5.27 5.48 6.07 6.65 7.24 7.84	0.9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6 -1.4 -2.3 -3.2 -4.1 -5.0	-1 -1 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0
1825 1850 1900 1950 2000 2100 2150 2200 2200 2300 2300 2400 2450 2550	41.9 41.8 41.7 41.6 41.6 41.5 41.4 41.4 41.4 41.3 41.2 41.1 41.1 41.0 40.9 40.9 40.8	13.8 13.7 13.7 13.6 13.6 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5	1.41 1.42 1.43 1.44 1.51 1.55 1.58 1.62 1.65 1.69 1.72 1.80 1.84 1.84 1.92 1.93	40.0 40.0 40.0 39.9 39.8 39.7 39.6 39.6 39.5 39.4 39.3 39.2 39.1 39.1	1.40 1.40 1.40 1.40 1.40 1.44 1.49 1.53 1.58 1.62 1.67 1.71 1.76 1.80 1.85 1.91	4.7 4.5 4.3 4.0 4.2 4.2 4.2 4.2 4.2 4.4 4.4 4.4 4.4 4.4	0.7 1.4 3.6 5.7 7.9 7.3 6.1 5.7 4.6 4.2 3.2 2.9 2.9 2.2 1.4 0.6	-15.0 5200 5250 5300 5500 5500 5500 5500 6000 6500 7000 7500 8000 8500 8500	36.3 36.2 36.1 35.8 35.6 35.4 35.2 34.9 34.0 33.1 32.2 31.4 30.5	15.8 15.9 15.9 16.1 16.2 16.3 16.5 16.9 17.3 17.6 17.9 18.2	Freque 4.57 4.63 4.69 4.92 5.04 5.15 5.27 5.50 6.12 6.74 7.36 7.97 8.59	36.0 35.9 35.9 35.6 35.5 35.4 35.3 35.1 34.5 33.9 33.3 32.7 32.1	4.66 4.71 4.76 5.07 5.17 5.27 5.48 6.07 6.65 7.24 7.84 8.45	0.9 0.8 0.7 0.3 0.1 0.0 -0.2 -0.6 -1.4 -2.3 -3.2 -4.1	500 -1 -1 -0 -0 -0 -0 0 0 0 0 1. 1. 1. 1. 1. 0. 0

TSL Dielectric Parameters

Figure C-3 600 – 5800 MHz Head Tissue Equivalent Matter

	FCC ID A3LSMN981W	Road to be part of @ element	SAR EVALUATION REPORT	SAMSUNG	Approved by: Quality Manager
	Test Dates:	DUT Type:			APPENDIX C:
	06/03/20 - 07/13/20	Portable Handset			Page 3 of 3
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