

Appendix E. Tissue & System Verification

The measuring results for tissue simulating liquid and system check are shown as below.

Note:

1. For Section 5.3, the dielectric properties of the tissue simulating liquid have been measured within 24 hours before the SAR testing and within $\pm 10\%$ of the target values. Liquid temperature during the SAR testing has kept within $\pm 2^\circ\text{C}$.
2. For Section 5.4, The SAR measurement system was validated according to procedures in KDB 865664 D01. The validation status in tabulated summary is as below.
3. For Section 5.5, Comparing to the reference SAR value provided by SPEAG in dipole calibration certificate, the deviation of system check results is within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots please refer to Appendix A of this report.
4. Comparing to the reference value provided by SPEAG, the validation data should be within its specification of $\pm 0.66\text{ dB}$. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Tissue Verification									Validation for CW			Validation for Modulation				System Validation					Note		
Plot No.	Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Targeted Conductivity (σ)	Targeted Permittivity (ϵ_r)	Deviation Conductivity (σ)	Deviation Permittivity (ϵ_r)	Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR	Date	Frequency (MHz)	Targeted 1g SAR (W/kg)	Measured 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
S01	2450	23.3	1.885	38.34	1.8	39.2	4.72	-2.19	Pass	Pass	Pass	OFDM	N/A	Pass	Jul. 07, 2021	2450	51.60	2.41	48.20	-6.59	737	7555	1589
S02	5250	23.2	4.878	37.061	4.71	35.9	3.57	-3.23	Pass	Pass	Pass	OFDM	N/A	Pass	Jul. 08, 2021	5250	80.60	4.13	82.60	2.48	1019	7555	1589
S03	5600	23.3	4.913	36.164	5.07	35.5	-3.10	1.87	Pass	Pass	Pass	OFDM	N/A	Pass	Jul. 07, 2021	5600	82.40	3.81	76.20	-7.52	1019	7555	1589
S04	5750	23.3	5.061	35.952	5.22	35.4	-3.05	1.56	Pass	Pass	Pass	OFDM	N/A	Pass	Jul. 07, 2021	5750	79.40	4.24	84.80	6.80	1019	7555	1589
S05	2450	23.2	1.882	38.359	1.8	39.2	4.56	-2.15	Pass	Pass	Pass	OFDM	N/A	Pass	Apr. 15, 2021	2450	51.60	2.58	51.60	0.00	737	3650	1356

Tissue Verification									Validation for CW			Validation for Modulation				System Validation					Note		
Plot No.	Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε _r)	Targeted Conductivity (σ)	Targeted Permittivity (ε _r)	Deviation Conductivity (σ)	Deviation Permittivity (ε _r)	Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR	Date	Frequency (MHz)	Targeted 1g SAR (W/kg)	Measured 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
S06	6500	23.3	6.21	33.7	6.07	34.5	2.31	-2.32	Pass	Pass	Pass	OFDM	N/A	Pass	Jun. 02, 2021	6500	285.00	31.2	312.00	9.47	1008	3971	1431
S07	6500	23.3	6.21	33.7	6.07	34.5	2.31	-2.32	Pass	Pass	Pass	OFDM	N/A	Pass	Jun. 02, 2021	6500	285.00	31.2	312.00	9.47	1008	3971	1431
S08	6500	23	6.19	33.8	6.07	34.5	1.98	-2.03	Pass	Pass	Pass	OFDM	N/A	Pass	Jun. 02, 2021	6500	285.00	27.5	275.00	-3.51	1008	7554	1590
S09	6500	23.3	6.21	33.7	6.07	34.5	2.31	-2.32	Pass	Pass	Pass	OFDM	N/A	Pass	Jun. 02, 2021	6500	285.00	31.2	312.00	9.47	1008	3971	1431

Plot No.	Test Date	Frequency [GHz]	mmWave Probe S/N	Verification Source S/N	Averaging Area [cm ²]	Distance [mm]	Target Power Density [W/m ²]	Measured Power Density [W/m ²]	Deviation [%]
S09	Jun. 11, 2021	10	9454	1025	4	10.0	45.8	42.3	-7.64%