11.5 Body-Worn Simultaneous Transmission Analysis

Table 11.5.1 Simultaneous Transmission Scenario (Body-Worn SAR at 15 mm)

Mode	Conf. (Body-Worn)	2G/3G/4G/5G + BT Ant.12 + BT Ant.8	Wi-Fi 2.4G Ant. 8	Wi-Fi 2.4G Ant.9	Wi-Fi 2.4G MIMO	Wi-Fi 5G Ant. 8	Wi-Fi 5G Ant. 9	Wi-Fi 5G MIMO	Wi-Fi 6G Ant. 8	Wi-Fi 6G Ant. 9	Wi-Fi 6G MIMO	Σ Body-Worn SAR (W/kg)																	
		1	2	3	4	5	6	7	8	9	10	1+4 +7	1+4 +10	1+2 +6	1+2 +5	1+3 +5	1+3 +6	1+2 +9	1+2 +8	1+3 +8	1+3 +9	1+2 +7	1+3 +7	1+2 +10	1+3 +10	1+4 +5	1+4 +6	1+4 +8	1+4 +9
GSM 850	Front	0.649	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.914	0.747	0.742	0.905	0.884	0.721	0.726	0.775	0.754	0.706	0.912	0.892	0.745	0.724	0.907	0.744	0.777	0.728
	Rear	0.695	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	1.088	0.932	0.979	0.965	1.035	1.049	0.850	0.789	0.859	0.920	1.015	1.085	0.859	0.929	1.039	1.053	0.863	0.924
GSM 1900	Front	0.289	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.554	0.387	0.382	0.545	0.524	0.361	0.366	0.415	0.394	0.346	0.552	0.532	0.385	0.364	0.547	0.384	0.417	0.368
	Rear	0.485	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.878	0.722	0.769	0.755	0.825	0.839	0.640	0.579	0.649	0.710	0.805	0.875	0.649	0.719	0.829	0.843	0.653	0.714
WCDMA 850	Front	0.119	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.384	0.217	0.212	0.375	0.354	0.191	0.196	0.245	0.224	0.176	0.382	0.362	0.215	0.194	0.377	0.214	0.247	0.198
	Rear	0.085	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.478	0.322	0.369	0.355	0.425	0.439	0.240	0.179	0.249	0.310	0.405	0.475	0.249	0.319	0.429	0.443	0.253	0.314
WCDMA 1700	Front	0.349	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.614	0.447	0.442	0.605	0.584	0.421	0.426	0.475	0.454	0.406	0.612	0.592	0.445	0.424	0.607	0.444	0.477	0.428
	Rear	0.725	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	1.118	0.962	1.009	0.995	1.065	1.079	0.880	0.819	0.889	0.950	1.045	1.115	0.889	0.959	1.069	1.083	0.893	0.954
WCDMA 1900	Front	0.259	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.524	0.357	0.352	0.515	0.494	0.331	0.336	0.385	0.364	0.316	0.522	0.502	0.355	0.334	0.517	0.354	0.387	0.338
	Rear	0.495	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.888	0.732	0.779	0.765	0.835	0.849	0.650	0.589	0.659	0.720	0.815	0.885	0.659	0.729	0.839	0.853	0.663	0.724
LTE B7	Front	0.239	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.504	0.337	0.332	0.495	0.474	0.311	0.316	0.365	0.344	0.296	0.502	0.482	0.335	0.314	0.497	0.334	0.367	0.318
	Rear	0.555	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.948	0.792	0.839	0.825	0.895	0.909	0.710	0.649	0.719	0.780	0.875	0.945	0.719	0.789	0.899	0.913	0.723	0.784
LTE B12	Front	0.419	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.684	0.517	0.512	0.675	0.654	0.491	0.496	0.545	0.524	0.476	0.682	0.662	0.515	0.494	0.677	0.514	0.547	0.498
	Rear	0.475	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.868	0.712	0.759	0.745	0.815	0.829	0.630	0.569	0.639	0.700	0.795	0.865	0.639	0.709	0.819	0.833	0.643	0.704
LTE B13	Front	0.289	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.554	0.387	0.382	0.545	0.524	0.361	0.366	0.415	0.394	0.346	0.552	0.532	0.385	0.364	0.547	0.384	0.417	0.368
	Rear	0.305	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.698	0.542	0.589	0.575	0.645	0.659	0.460	0.399	0.469	0.530	0.625	0.695	0.469	0.539	0.649	0.663	0.473	0.534
LTE B14	Front	0.279	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.544	0.377	0.372	0.535	0.514	0.351	0.356	0.405	0.384	0.336	0.542	0.522	0.375	0.354	0.537	0.374	0.407	0.358
	Rear	0.315	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.708	0.552	0.599	0.585	0.655	0.669	0.470	0.409	0.479	0.540	0.635	0.705	0.479	0.549	0.659	0.673	0.483	0.544
LTE B25/2	Front	0.229	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.494	0.327	0.322	0.485	0.464	0.301	0.306	0.355	0.334	0.286	0.492	0.472	0.325	0.304	0.487	0.324	0.357	0.308
	Rear	0.465	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.858	0.702	0.749	0.735	0.805	0.819	0.620	0.559	0.629	0.690	0.785	0.855	0.629	0.699	0.809	0.823	0.633	0.694
LTE B26	Front	0.279	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.544	0.377	0.372	0.535	0.514	0.351	0.356	0.405	0.384	0.336	0.542	0.522	0.375	0.354	0.537	0.374	0.407	0.358
	Rear	0.255	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.648	0.492	0.539	0.525	0.595	0.609	0.410	0.349	0.419	0.480	0.575	0.645	0.419	0.489	0.599	0.613	0.423	0.484
LTE B30	Front	0.179	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.444	0.277	0.272	0.435	0.414	0.251	0.256	0.305	0.284	0.236	0.442	0.422	0.275	0.254	0.437	0.274	0.307	0.258
	Rear	0.355	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.748	0.592	0.639	0.625	0.695	0.709	0.510	0.449	0.519	0.580	0.675	0.745	0.519	0.589	0.699	0.713	0.523	0.584
LTE B38	Front	0.149	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.414	0.247	0.242	0.405	0.384	0.221	0.226	0.275	0.254	0.206	0.412	0.392	0.245	0.224	0.407	0.244	0.277	0.228
	Rear	0.395	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.788	0.632	0.679	0.665	0.735	0.749	0.550	0.489	0.559	0.620	0.715	0.785	0.559	0.629	0.739	0.753	0.563	0.624
LTE B41	Front	0.239	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.504	0.337	0.332	0.495	0.474	0.311	0.316	0.365	0.344	0.296	0.502	0.482	0.335	0.314	0.497	0.334	0.367	0.318
	Rear	0.195	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.588	0.432	0.479	0.465	0.535	0.549	0.350	0.289	0.359	0.420	0.515	0.585	0.359	0.429	0.539	0.553	0.363	0.424
LTE B42	Front	0.089	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.354	0.187	0.182	0.345	0.324	0.161	0.166	0.215	0.194	0.146	0.352	0.332	0.185	0.164	0.347	0.184	0.217	0.168
	Rear	0.565	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.958	0.802	0.849	0.835	0.905	0.919	0.720	0.659	0.729	0.790	0.885	0.955	0.729	0.799	0.909	0.923	0.733	0.794
LTE B48	Front	0.089	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.354	0.187	0.182	0.345	0.324	0.161	0.166	0.215	0.194	0.146	0.352	0.332	0.185	0.164	0.347	0.184	0.217	0.168
	Rear	0.060	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.453	0.297	0.344	0.330	0.400	0.414	0.215	0.154	0.224	0.285	0.380	0.450	0.224	0.294	0.404	0.418	0.228	0.289
LTE B66	Front	0.339	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.604	0.437	0.432	0.595	0.574	0.411	0.416	0.465	0.444	0.396	0.602	0.582	0.435	0.414	0.597	0.434	0.467	0.418
	Rear	0.655	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	1.048	0.892	0.939	0.925	0.995	1.009	0.810	0.749	0.819	0.880	0.975	1.045	0.819	0.889	0.999	1.013	0.823	0.884
LTE B71	Front	0.439	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.704	0.537	0.532	0.695	0.674	0.511	0.516	0.565	0.544	0.496	0.702	0.682	0.535	0.514	0.697	0.534	0.567	0.518
	Rear	0.455	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.848	0.692	0.739	0.725	0.795	0.809	0.610	0.549	0.619	0.680	0.775	0.845	0.619	0.689	0.799	0.813	0.623	0.684
n 7	Front	0.179	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.444	0.277	0.272	0.435	0.414	0.251	0.256	0.305	0.284	0.236	0.442	0.422	0.275	0.254	0.437	0.274	0.307	0.258
	Rear	0.395	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.788	0.632	0.679	0.665	0.735	0.749	0.550	0.489	0.559	0.620	0.715	0.785	0.559	0.629	0.739	0.753	0.563	0.624
n 12	Front	0.409	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.674	0.507	0.502	0.665	0.644	0.481	0.486	0.535	0.514	0.466	0.672	0.652	0.505	0.484	0.667	0.504	0.537	0.488
	Rear	0.465	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.858	0.702	0.749	0.735	0.805	0.819	0.620	0.559	0.629	0.690	0.785	0.855	0.629	0.699	0.809	0.823	0.633	0.694
n 13	Front	0.129	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.394	0.227	0.222	0.385	0.364	0.201	0.206	0.255	0.234	0.186	0.392	0.372	0.225	0.204	0.387	0.224	0.257	0.208
	Rear	0.245	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.638	0.482	0.529	0.515	0.585	0.599	0.400	0.339	0.409	0.470	0.565	0.635	0.409	0.479	0.589	0.603	0.413	0.474
n 14	Front	0.179	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.444	0.277	0.272	0.435	0.414	0.251	0.256	0.305	0.284	0.236	0.442	0.422	0.275	0.254	0.437	0.274	0.307	0.258
	Rear	0.205	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.598	0.442	0.489	0.475	0.545	0.559	0.360	0.299	0.369	0.430	0.525	0.595	0.369	0.439	0.549	0.563	0.373	0.434
n 25 / 2	Front	0.159	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.424	0.257	0.252	0.415	0.394	0.231	0.236	0.285	0.264	0.216	0.422	0.402	0.255	0.234	0.417	0.254	0.287	0.238
	Rear	0.285	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.678	0.522	0.569	0.555	0.625	0.639	0.440	0.379	0.449	0.510	0.605	0.675	0.449	0.519	0.629	0.643	0.453	0.514
n 26	Front	0.189	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.454	0.287	0.282	0.445	0.424	0.261	0.266	0.315	0.294	0.246	0.452	0.432	0.285	0.264	0.447	0.284	0.317	0.268
	Rear	0.255	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.648	0.492	0.539	0.525	0.595	0.609	0.410	0.349	0.419	0.480	0.575	0.645	0.419	0.489	0.599	0.613	0.423	0.484
n 30	Front	0.119	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.384	0.217	0.212	0.375	0.354	0.191	0.196	0.245	0.224	0.176	0.382	0.362	0.215	0.194	0.377	0.214	0.247	0.198
	Rear	0.235	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.628	0.472	0.519	0.505	0.575	0.589	0.390	0.329	0.399	0.460	0.555	0.625	0.399	0.469	0.579	0.593	0.403	0.464
n 66	Front	0.219	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.484	0.317	0.312	0.475	0.454	0.291	0.296	0.345	0.324	0.276	0.482	0.462	0.315	0.294	0.477	0.314	0.347	0.298
	Rear	0.485	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.878	0.722	0.769	0.755	0.825	0.839	0.640	0.579	0.649	0.710	0.805	0.875	0.649	0.719	0.829	0.843	0.653	0.714
n 71	Front	0.299	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.564	0.397	0.392	0.555	0.534	0.371	0.376	0.425	0.404	0.356	0.562	0.542	0.395	0.374	0.557	0.394	0.427	0.378
	Rear	0.325	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.718	0.562	0.609	0.595	0.665	0.679	0.480	0.419	0.489	0.550	0.645	0.715	0.489	0.559	0.669	0.683	0.493	0.554
n 38	Front	0.189	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.454	0.287	0.282	0.445	0.424	0.261	0.266	0.315	0.294	0.246	0.452	0.432	0.285	0.264	0.447	0.284	0.317	0.268
	Rear	0.485	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.878	0.722	0.769	0.755	0.825	0.839	0.640	0.579	0.649	0.710	0.805	0.875	0.649	0.719	0.829	0.843	0.653	0.714
n 41	Front	0.219	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.484	0.317	0.312	0.475	0.454	0.291	0.296	0.345	0.324	0.276	0.482	0.462	0.315	0.294	0.477	0.314	0.347	0.298
	Rear	0.415	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.808	0.652	0.699	0.685	0.755	0.769	0.570	0.509	0.579	0.640	0.735	0.805	0.579	0.649	0.759	0.773	0.583	0.644
n 41 HPUE	Front	0.309	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.574	0.407	0.402	0.565	0.544	0.381	0.386	0.435	0.414	0.366	0.572	0.552	0.405	0.384	0.567	0.404	0.437	0.388
	Rear	0.465	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.858	0.702	0.749	0.735	0.805	0.819	0.620	0.559	0.629	0.690	0.785	0.855	0.629	0.699	0.809	0.823	0.633	0.694
n 48	Front	0.139	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.404	0.237	0.232	0.395	0.374	0.211	0.216	0.265	0.244	0.196	0.402	0.382	0.235	0.214	0.397	0.234	0.267	0.218
	Rear	0.655	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	1.048	0.892	0.939	0.925	0.995	1.009	0.810	0.749	0.819	0.880	0.975	1.045	0.819	0.889	0.999	1.013	0.823	0.884
n 77 / 78 3.45~3.55	Front	0.099	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.364	0.197	0.192	0.355	0.334	0.171	0.176	0.225	0.204	0.156	0.362	0.342	0.195	0.174	0.357	0.194	0.227	0.178
	Rear	0.725	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	1.118	0.962	1.009	0.995	1.065	1.079	0.880	0.819	0.889	0.950	1.045	1.115	0.889	0.959	1.069	1.083	0.893	0.954
n 77 / 78 3.70~3.98	Front	0.109	0.060	0.039	0.062	0.196	0.033	0.203	0.066	0.017	0.036	0.374	0.207	0.202	0.365	0.344	0.181	0.186	0.235	0.214	0.166	0.372	0.352	0.205	0.184	0.367	0.204	0.237	0.188
	Rear	0.585	0.064	0.134	0.137	0.207	0.221	0.256	0.031	0.092	0.101	0.978	0.822	0.869	0.855	0.925	0.939	0.740	0.679	0.749	0.810	0.905	0.975	0.749	0.819	0.929	0.943	0.753	0.814

Table 11.5.2 Total Exposure Ratio (Body-Worn)

Mode	Conf. (Body-Worn)	2G/3G/4G/5G + BT Ant.12 + BT Ant.8	Wi-Fi 2.4G Ant.8	Wi-Fi 2.4G Ant.9	Wi-Fi 2.4G MIMO	Wi-Fi 6G Ant.8	Wi-Fi 6G Ant.9	Wi-Fi 6G MIMO	Body-Worn TER								
		1	2	3	4	8	9	10	1+4+10	1+2+9	1+2+8	1+3+8	1+3+9	1+2+10	1+3+10	1+4+8	1+4+9
GSM 850	Front	0.406	0.037	0.024	0.039	0.103	0.075	0.115	0.559	0.518	0.546	0.533	0.505	0.558	0.545	0.547	0.519
	Rear	0.434	0.040	0.084	0.086	0.076	0.205	0.253	0.773	0.679	0.550	0.594	0.723	0.727	0.771	0.596	0.725
GSM 1900	Front	0.181	0.037	0.024	0.039	0.103	0.075	0.115	0.334	0.293	0.321	0.308	0.280	0.333	0.320	0.322	0.294
	Rear	0.303	0.040	0.084	0.086	0.076	0.205	0.253	0.642	0.548	0.419	0.462	0.591	0.596	0.640	0.465	0.593
WCDMA 850	Front	0.075	0.037	0.024	0.039	0.103	0.075	0.115	0.228	0.187	0.215	0.202	0.174	0.227	0.214	0.216	0.188
	Rear	0.053	0.040	0.084	0.086	0.076	0.205	0.253	0.392	0.298	0.169	0.212	0.341	0.346	0.390	0.215	0.343
WCDMA 1700	Front	0.218	0.037	0.024	0.039	0.103	0.075	0.115	0.372	0.330	0.358	0.345	0.317	0.370	0.357	0.360	0.332
	Rear	0.453	0.040	0.084	0.086	0.076	0.205	0.253	0.792	0.698	0.569	0.612	0.741	0.746	0.790	0.615	0.743
WCDMA 1900	Front	0.162	0.037	0.024	0.039	0.103	0.075	0.115	0.315	0.274	0.302	0.289	0.261	0.314	0.301	0.303	0.275
	Rear	0.309	0.040	0.084	0.086	0.076	0.205	0.253	0.648	0.554	0.425	0.469	0.598	0.602	0.646	0.471	0.600
LTE B7	Front	0.150	0.037	0.024	0.039	0.103	0.075	0.115	0.303	0.262	0.290	0.277	0.249	0.302	0.289	0.291	0.263
	Rear	0.347	0.040	0.084	0.086	0.076	0.205	0.253	0.686	0.591	0.463	0.506	0.635	0.640	0.683	0.508	0.637
LTE B12	Front	0.262	0.037	0.024	0.039	0.103	0.075	0.115	0.415	0.374	0.402	0.389	0.361	0.414	0.401	0.403	0.375
	Rear	0.297	0.040	0.084	0.086	0.076	0.205	0.253	0.636	0.541	0.413	0.456	0.585	0.590	0.633	0.458	0.587
LTE B13	Front	0.181	0.037	0.024	0.039	0.103	0.075	0.115	0.334	0.293	0.321	0.308	0.280	0.333	0.320	0.322	0.294
	Rear	0.190	0.040	0.084	0.086	0.076	0.205	0.253	0.529	0.435	0.306	0.350	0.479	0.484	0.527	0.352	0.481
LTE B14	Front	0.175	0.037	0.024	0.039	0.103	0.075	0.115	0.328	0.287	0.315	0.302	0.274	0.327	0.314	0.316	0.288
	Rear	0.197	0.040	0.084	0.086	0.076	0.205	0.253	0.536	0.441	0.313	0.356	0.485	0.490	0.533	0.358	0.487
LTE B25/2	Front	0.143	0.037	0.024	0.039	0.103	0.075	0.115	0.297	0.255	0.283	0.270	0.242	0.295	0.282	0.285	0.257
	Rear	0.290	0.040	0.084	0.086	0.076	0.205	0.253	0.629	0.535	0.406	0.450	0.579	0.584	0.627	0.452	0.581
LTE B26	Front	0.175	0.037	0.024	0.039	0.103	0.075	0.115	0.328	0.287	0.315	0.302	0.274	0.327	0.314	0.316	0.288
	Rear	0.159	0.040	0.084	0.086	0.076	0.205	0.253	0.498	0.404	0.275	0.319	0.448	0.452	0.496	0.321	0.450
LTE B30	Front	0.112	0.037	0.024	0.039	0.103	0.075	0.115	0.265	0.224	0.252	0.239	0.211	0.264	0.251	0.253	0.225
	Rear	0.222	0.040	0.084	0.086	0.076	0.205	0.253	0.561	0.466	0.338	0.381	0.510	0.515	0.558	0.383	0.512
LTE B38	Front	0.093	0.037	0.024	0.039	0.103	0.075	0.115	0.247	0.205	0.233	0.220	0.192	0.245	0.232	0.235	0.207
	Rear	0.247	0.040	0.084	0.086	0.076	0.205	0.253	0.586	0.491	0.363	0.406	0.535	0.540	0.583	0.408	0.537
LTE B41	Front	0.150	0.037	0.024	0.039	0.103	0.075	0.115	0.303	0.262	0.290	0.277	0.249	0.302	0.289	0.291	0.263
	Rear	0.122	0.040	0.084	0.086	0.076	0.205	0.253	0.461	0.366	0.238	0.281	0.410	0.415	0.458	0.283	0.412
LTE B42	Front	0.056	0.037	0.024	0.039	0.103	0.075	0.115	0.209	0.168	0.196	0.183	0.155	0.208	0.195	0.197	0.169
	Rear	0.353	0.040	0.084	0.086	0.076	0.205	0.253	0.692	0.598	0.469	0.512	0.641	0.646	0.690	0.515	0.643
LTE B48	Front	0.056	0.037	0.024	0.039	0.103	0.075	0.115	0.209	0.168	0.196	0.183	0.155	0.208	0.195	0.197	0.169
	Rear	0.037	0.040	0.084	0.086	0.076	0.205	0.253	0.376	0.282	0.153	0.197	0.326	0.330	0.374	0.199	0.328
LTE B66	Front	0.212	0.037	0.024	0.039	0.103	0.075	0.115	0.365	0.324	0.352	0.339	0.311	0.364	0.351	0.353	0.325
	Rear	0.409	0.040	0.084	0.086	0.076	0.205	0.253	0.748	0.654	0.525	0.569	0.698	0.702	0.746	0.571	0.700
LTE B71	Front	0.275	0.037	0.024	0.039	0.103	0.075	0.115	0.428	0.387	0.415	0.402	0.374	0.427	0.414	0.416	0.388
	Rear	0.284	0.040	0.084	0.086	0.076	0.205	0.253	0.623	0.529	0.400	0.444	0.573	0.577	0.621	0.446	0.575
n 7	Front	0.112	0.037	0.024	0.039	0.103	0.075	0.115	0.265	0.224	0.252	0.239	0.211	0.264	0.251	0.253	0.225
	Rear	0.247	0.040	0.084	0.086	0.076	0.205	0.253	0.586	0.491	0.363	0.406	0.535	0.540	0.583	0.408	0.537
n 12	Front	0.256	0.037	0.024	0.039	0.103	0.075	0.115	0.409	0.368	0.396	0.383	0.355	0.408	0.395	0.397	0.369
	Rear	0.290	0.040	0.084	0.086	0.076	0.205	0.253	0.629	0.535	0.406	0.450	0.579	0.584	0.627	0.452	0.581
n 13	Front	0.081	0.037	0.024	0.039	0.103	0.075	0.115	0.234	0.193	0.221	0.208	0.180	0.233	0.220	0.222	0.194
	Rear	0.153	0.040	0.084	0.086	0.076	0.205	0.253	0.492	0.398	0.269	0.312	0.441	0.446	0.490	0.315	0.443
n 14	Front	0.112	0.037	0.024	0.039	0.103	0.075	0.115	0.265	0.224	0.252	0.239	0.211	0.264	0.251	0.253	0.225
	Rear	0.128	0.040	0.084	0.086	0.076	0.205	0.253	0.467	0.373	0.244	0.287	0.416	0.421	0.465	0.290	0.418
n 25 / 2	Front	0.100	0.037	0.024	0.039	0.103	0.075	0.115	0.253	0.212	0.240	0.227	0.199	0.252	0.239	0.241	0.213
	Rear	0.178	0.040	0.084	0.086	0.076	0.205	0.253	0.517	0.423	0.294	0.337	0.466	0.471	0.515	0.340	0.468
n 26	Front	0.118	0.037	0.024	0.039	0.103	0.075	0.115	0.272	0.230	0.258	0.245	0.217	0.270	0.257	0.260	0.232
	Rear	0.159	0.040	0.084	0.086	0.076	0.205	0.253	0.498	0.404	0.275	0.319	0.448	0.452	0.496	0.321	0.450
n 30	Front	0.075	0.037	0.024	0.039	0.103	0.075	0.115	0.228	0.187	0.215	0.202	0.174	0.227	0.214	0.216	0.188
	Rear	0.147	0.040	0.084	0.086	0.076	0.205	0.253	0.486	0.391	0.263	0.306	0.435	0.440	0.483	0.308	0.437
n 66	Front	0.137	0.037	0.024	0.039	0.103	0.075	0.115	0.290	0.249	0.277	0.264	0.236	0.289	0.276	0.278	0.250
	Rear	0.303	0.040	0.084	0.086	0.076	0.205	0.253	0.642	0.548	0.419	0.462	0.591	0.596	0.640	0.465	0.593
n 71	Front	0.187	0.037	0.024	0.039	0.103	0.075	0.115	0.340	0.299	0.327	0.314	0.286	0.339	0.326	0.328	0.300
	Rear	0.203	0.040	0.084	0.086	0.076	0.205	0.253	0.542	0.448	0.319	0.362	0.491	0.496	0.540	0.365	0.493
n 38	Front	0.118	0.037	0.024	0.039	0.103	0.075	0.115	0.272	0.230	0.258	0.245	0.217	0.270	0.257	0.260	0.232
	Rear	0.303	0.040	0.084	0.086	0.076	0.205	0.253	0.642	0.548	0.419	0.462	0.591	0.596	0.640	0.465	0.593
n 41	Front	0.137	0.037	0.024	0.039	0.103	0.075	0.115	0.290	0.249	0.277	0.264	0.236	0.289	0.276	0.278	0.250
	Rear	0.259	0.040	0.084	0.086	0.076	0.205	0.253	0.598	0.504	0.375	0.419	0.548	0.552	0.596	0.421	0.550
n 41 HPUE	Front	0.193	0.037	0.024	0.039	0.103	0.075	0.115	0.347	0.305	0.333	0.320	0.292	0.345	0.332	0.335	0.307
	Rear	0.290	0.040	0.084	0.086	0.076	0.205	0.253	0.629	0.535	0.406	0.450	0.579	0.584	0.627	0.452	0.581
n 48	Front	0.087	0.037	0.024	0.039	0.103	0.075	0.115	0.240	0.199	0.227	0.214	0.186	0.239	0.226	0.228	0.200
	Rear	0.409	0.040	0.084	0.086	0.076	0.205	0.253	0.748	0.654	0.525	0.569	0.698	0.702	0.746	0.571	0.700
n 77 / 78 3.45~3.55	Front	0.062	0.037	0.024	0.039	0.103	0.075	0.115	0.215	0.174	0.202	0.189	0.161	0.214	0.201	0.203	0.175
	Rear	0.453	0.040	0.084	0.086	0.076	0.205	0.253	0.792	0.698	0.569	0.612	0.741	0.746	0.790	0.615	0.743
n 77 / 78 3.70~3.98	Front	0.068	0.037	0.024	0.039	0.103	0.075	0.115	0.222	0.180	0.208	0.195	0.167	0.220	0.207	0.210	0.182
	Rear	0.365	0.040	0.084	0.086	0.076	0.205	0.253	0.704	0.610	0.481	0.525	0.654	0.659	0.702	0.527	0.656

11.6 Hotspot Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v02r01, the device edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 11.6.1 Simultaneous Transmission Scenario (Hotspot at 10 mm)

Mode	Conf. (Hotspot)	2G/3G/4G/5G + BT Ant.12 + BT Ant.8	Wi-Fi 2.4G Ant.8	Wi-Fi 2.4G Ant.9	Wi-Fi 2.4G MIMO	Wi-Fi 5G Ant.8	Wi-Fi 5G Ant.9	Wi-Fi 5G MIMO	Σ Hotspot SAR (W/kg)								
		1	2	3	4	5	6	7	1+4+7	1+2+6	1+2+5	1+3+5	1+3+6	1+2+7	1+3+7	1+4+5	1+4+6
GSM 850	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.240	-	-	-	-	-	-	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240
	Front	0.482	0.093	0.045	0.101	0.223	0.039	0.180	0.763	0.614	0.798	0.751	0.566	0.754	0.707	0.806	0.622
	Rear	0.543	0.120	0.221	0.239	0.270	0.153	0.310	1.092	0.816	0.933	1.035	0.918	0.973	1.074	1.053	0.936
	Right	0.234	0.129	-	0.126	0.513	-	0.411	0.771	0.363	0.876	0.747	0.234	0.774	0.645	0.873	0.360
	Left	0.400	-	0.181	0.185	-	0.083	0.095	0.679	0.483	0.400	0.581	0.664	0.495	0.676	0.585	0.667
GSM 1900	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.550	-	-	-	-	-	-	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
	Front	0.272	0.093	0.045	0.101	0.223	0.039	0.180	0.553	0.404	0.588	0.541	0.356	0.544	0.497	0.596	0.412
	Rear	0.383	0.120	0.221	0.239	0.270	0.153	0.310	0.932	0.656	0.773	0.875	0.758	0.813	0.914	0.893	0.776
	Right	0.194	0.129	-	0.126	0.513	-	0.411	0.731	0.323	0.836	0.707	0.194	0.734	0.605	0.833	0.320
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
WCDM A 850	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.180	-	-	-	-	-	-	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
	Front	0.302	0.093	0.045	0.101	0.223	0.039	0.180	0.583	0.434	0.618	0.571	0.386	0.574	0.527	0.626	0.442
	Rear	0.313	0.120	0.221	0.239	0.270	0.153	0.310	0.862	0.586	0.703	0.805	0.688	0.743	0.844	0.823	0.706
	Right	0.274	0.129	-	0.126	0.513	-	0.411	0.811	0.403	0.916	0.787	0.274	0.814	0.685	0.913	0.400
	Left	0.350	-	0.181	0.185	-	0.083	0.095	0.629	0.433	0.350	0.531	0.614	0.445	0.626	0.535	0.617
WCDM A 1700	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.770	-	-	-	-	-	-	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770
	Front	0.402	0.093	0.045	0.101	0.223	0.039	0.180	0.683	0.534	0.718	0.671	0.486	0.674	0.627	0.726	0.542
	Rear	0.653	0.120	0.221	0.239	0.270	0.153	0.310	1.202	0.926	1.043	1.145	1.028	1.083	1.184	1.163	1.046
	Right	0.184	0.129	-	0.126	0.513	-	0.411	0.721	0.313	0.826	0.697	0.184	0.724	0.595	0.823	0.310
	Left	0.060	-	0.181	0.185	-	0.083	0.095	0.339	0.143	0.060	0.241	0.324	0.155	0.336	0.245	0.327
WCDM A 1900	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.760	-	-	-	-	-	-	0.760	0.760	0.760	0.760	0.760	0.760	0.760	0.760	0.760
	Front	0.432	0.093	0.045	0.101	0.223	0.039	0.180	0.713	0.564	0.748	0.701	0.516	0.704	0.657	0.756	0.572
	Rear	0.623	0.120	0.221	0.239	0.270	0.153	0.310	1.172	0.896	1.013	1.115	0.998	1.053	1.154	1.133	1.016
	Right	0.284	0.129	-	0.126	0.513	-	0.411	0.821	0.413	0.926	0.797	0.284	0.824	0.695	0.923	0.410
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 7	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.130	-	-	-	-	-	-	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
	Front	0.272	0.093	0.045	0.101	0.223	0.039	0.180	0.553	0.404	0.588	0.541	0.356	0.544	0.497	0.596	0.412
	Rear	0.483	0.120	0.221	0.239	0.270	0.153	0.310	1.032	0.756	0.873	0.975	0.858	0.913	1.014	0.993	0.876
	Right	0.584	0.129	-	0.126	0.513	-	0.411	1.121	0.713	**1.226**	1.097	0.584	1.124	0.995	1.223	0.710
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 12	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.130	-	-	-	-	-	-	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
	Front	0.412	0.093	0.045	0.101	0.223	0.039	0.180	0.693	0.544	0.728	0.681	0.496	0.684	0.637	0.736	0.552
	Rear	0.563	0.120	0.221	0.239	0.270	0.153	0.310	1.112	0.836	0.953	1.055	0.938	0.993	1.094	1.073	0.956
	Right	0.334	0.129	-	0.126	0.513	-	0.411	0.871	0.463	0.976	0.847	0.334	0.874	0.745	0.973	0.460
	Left	0.480	-	0.181	0.185	-	0.083	0.095	0.759	0.563	0.480	0.661	0.744	0.575	0.756	0.665	0.747
LTE Band 13	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.180	-	-	-	-	-	-	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
	Front	0.362	0.093	0.045	0.101	0.223	0.039	0.180	0.643	0.494	0.678	0.631	0.446	0.634	0.587	0.686	0.502
	Rear	0.383	0.120	0.221	0.239	0.270	0.153	0.310	0.932	0.656	0.773	0.875	0.758	0.813	0.914	0.893	0.776
	Right	0.264	0.129	-	0.126	0.513	-	0.411	0.801	0.393	0.906	0.777	0.264	0.804	0.675	0.903	0.390
	Left	0.440	-	0.181	0.185	-	0.083	0.095	0.719	0.523	0.440	0.621	0.704	0.535	0.716	0.625	0.707
LTE Band 14	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.240	-	-	-	-	-	-	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240
	Front	0.302	0.093	0.045	0.101	0.223	0.039	0.180	0.583	0.434	0.618	0.571	0.386	0.574	0.527	0.626	0.442
	Rear	0.423	0.120	0.221	0.239	0.270	0.153	0.310	0.972	0.696	0.813	0.915	0.798	0.853	0.954	0.933	0.816
	Right	0.204	0.129	-	0.126	0.513	-	0.411	0.741	0.333	0.846	0.717	0.204	0.744	0.615	0.843	0.330
	Left	0.380	-	0.181	0.185	-	0.083	0.095	0.659	0.463	0.380	0.561	0.644	0.475	0.656	0.565	0.647
LTE Band 25 / 2	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.900	-	-	-	-	-	-	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900	0.900
	Front	0.442	0.093	0.045	0.101	0.223	0.039	0.180	0.723	0.574	0.758	0.711	0.526	0.714	0.667	0.766	0.582
	Rear	0.653	0.120	0.221	0.239	0.270	0.153	0.310	1.202	0.926	1.043	1.145	1.028	1.083	1.184	1.163	1.046
	Right	0.514	0.129	-	0.126	0.513	-	0.411	1.051	0.643	1.156	1.027	0.514	1.054	0.925	1.153	0.640
	Left	0.090	-	0.181	0.185	-	0.083	0.095	0.369	0.173	0.090	0.271	0.354	0.185	0.366	0.275	0.357
LTE Band 26	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.150	-	-	-	-	-	-	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
	Front	0.332	0.093	0.045	0.101	0.223	0.039	0.180	0.613	0.464	0.648	0.601	0.416	0.604	0.557	0.656	0.472
	Rear	0.463	0.120	0.221	0.239	0.270	0.153	0.310	1.012	0.736	0.853	0.955	0.838	0.893	0.994	0.973	0.856
	Right	0.234	0.129	-	0.126	0.513	-	0.411	0.771	0.363	0.876	0.747	0.234	0.774	0.645	0.873	0.360
	Left	0.280	-	0.181	0.185	-	0.083	0.095	0.559	0.363	0.280	0.461	0.544	0.375	0.556	0.465	0.547
LTE Band 30	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.352	0.093	0.045	0.101	0.223	0.039	0.180	0.633	0.484	0.668	0.621	0.436	0.624	0.577	0.676	0.492
	Rear	0.553	0.120	0.221	0.239	0.270	0.153	0.310	1.102	0.826	0.943	1.045	0.928	0.983	1.084	1.063	0.946
	Right	0.024	0.129	-	0.126	0.513	-	0.411	0.561	0.153	0.666	0.537	0.024	0.564	0.435	0.663	0.150
	Left	0.560	-	0.181	0.185	-	0.083	0.095	0.839	0.643	0.560	0.741	0.824	0.655	0.836	0.745	0.827
LTE Band 38	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.150	-	-	-	-	-	-	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
	Front	0.282	0.093	0.045	0.101	0.223	0.039	0.180	0.563	0.414	0.598	0.551	0.366	0.554	0.507	0.606	0.422
	Rear	0.613	0.120	0.221	0.239	0.270	0.153	0.310	1.162	0.886	1.003	1.105	0.988	1.043	1.144	1.123	1.006
	Right	0.564	0.129	-	0.126	0.513	-	0.411	1.101	0.693	1.206	1.077	0.564	1.104	0.975	1.203	0.690
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 41	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.192	0.093	0.045	0.101	0.223	0.039	0.180	0.473	0.324	0.508	0.461	0.276	0.464	0.417	0.516	0.332
	Rear	0.373	0.120	0.221	0.239	0.270	0.153	0.310	0.922	0.646	0.763	0.865	0.748	0.803	0.904	0.883	0.766
	Right	0.024	0.129	-	0.126	0.513	-	0.411	0.561	0.153	0.666	0.537	0.024	0.564	0.435	0.663	0.150
	Left	0.340	-	0.181	0.185	-	0.083	0.095	0.619	0.423	0.340	0.521	0.604	0.435	0.616	0.525	0.607
LTE Band 42	Top	0.073	0.097	0.003	0.089	0.057	0.011	0.070	0.231	0.180	0.227	0.133	0.086	0.239	0.145	0.219	0.172
	Bottom	0.000	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Front	0.122	0.093	0.045	0.101	0.223	0.039	0.180	0.403	0.254	0.438	0.391	0.206	0.394	0.347	0.446	0.262
	Rear	0.403	0.120	0.221	0.239	0.270	0.153	0.310	0.952	0.676	0.793	0.895	0.778	0.833	0.934	0.913	0.796
	Right	0.214	0.129	-	0.126	0.513	-	0.411	0.751	0.343	0.856	0.727	0.214	0.754	0.625	0.853	0.340
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 48	Top	0.103	0.097	0.003	0.089	0.057	0.011	0.070	0.261	0.210	0.257	0.163	0.116	0.269	0.175	0.249	0.202
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.092	0.093	0.045	0.101	0.223	0.039	0.180	0.373	0.224	0.408	0.361	0.176	0.364	0.317	0.416	0.232
	Rear	0.313	0.120	0.221	0.239	0.270	0.153	0.310	0.862	0.586	0.703	0.805	0.688	0.743	0.844	0.823	0.706
	Right	0.214	0.129	-	0.126	0.513	-	0.411	0.751	0.343	0.856	0.727	0.214	0.754	0.625	0.853	0.340
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 66 / 4	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.740	-	-	-	-	-	-	0.740	0.740	0.740	0.740	0.740	0.740	0.740	0.740	0.740
	Front	0.332	0.093	0.045	0.101	0.223	0.039	0.180	0.613	0.464	0.648	0.601	0.416	0.604	0.557	0.656	0.472
	Rear	0.593	0.120	0.221	0.239	0.270	0.153	0.310	1.142	0.866	0.983	1.085	0.968	1.023	1.124	1.103	0.986
	Right	0.204	0.129	-	0.126	0.513	-	0.411	0.741	0.333	0.846	0.717	0.204	0.744	0.615	0.843	0.330
	Left	-	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
LTE Band 71	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.080	-	-	-	-	-	-	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
	Front	0.432	0.093	0.045	0.101	0.223	0.039	0.180	0.713	0.564	0.748	0.701	0.516	0.704	0.657	0.756	0.572
	Rear	0.563	0.120	0.221	0.239	0.270	0.153	0.310	1.112	0.836	0.953	1.055	0.938	0.993	1.094	1.073	0.956
	Right	0.404	0.129	-	0.126	0.513	-	0.411	0.941	0.533	1.046	0.917	0.404	0.944	0.815	1.043	0.530
	Left	0.430	-	0.181	0.185	-	0.083	0.095	0.709	0.513	0.430	0.611	0.694	0.525	0.706	0.615	0.697
n 7	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.140	-	-	-	-	-	-	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Front	0.282	0.093	0.045	0.101	0.223	0.039	0.180	0.563	0.414	0.598	0.551	0.366	0.554	0.507	0.606	0.422
	Rear	0.543	0.120	0.221	0.239	0.270	0.153	0.310	1.092	0.816	0.933	1.035	0.918	0.973	1.074	1.053	0.936
	Right	0.564	0.129	-	0.126	0.513	-	0.411	1.101	0.693	1.206	1.077	0.564	1.104	0.975	1.203	0.690
	Left	-	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
n 12	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.090	-	-	-	-	-	-	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
	Front	0.412	0.093	0.045	0.101	0.223	0.039	0.180	0.693	0.544	0.728	0.681	0.496	0.684	0.637	0.736	0.552
	Rear	0.523	0.120	0.221	0.239	0.270	0.153	0.310	1.072	0.796	0.913	1.015	0.898	0.953	1.054	1.033	0.916
	Right	0.244	0.129	-	0.126	0.513	-	0.411	0.781	0.373	0.886	0.757	0.244	0.784	0.655	0.883	0.370
	Left	0.390	-	0.181	0.185	-	0.083	0.095	0.669	0.473	0.390	0.571	0.654	0.485	0.666	0.575	0.657
n 13	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.110	-	-	-	-	-	-	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110
	Front	0.232	0.093	0.045	0.101	0.223	0.039	0.180	0.513	0.364	0.548	0.501	0.316	0.504	0.457	0.556	0.372
	Rear	0.453	0.120	0.221	0.239	0.270	0.153	0.310	1.002	0.726	0.843	0.945	0.828	0.883	0.984	0.963	0.846
	Right	0.084	0.129	-	0.126	0.513	-	0.411	0.621	0.213	0.726	0.597	0.084	0.624	0.495	0.723	0.210
	Left	0.120	-	0.181	0.185	-	0.083	0.095	0.399	0.203	0.120	0.301	0.384	0.215	0.396	0.305	0.387
n 14	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.180	-	-	-	-	-	-	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
	Front	0.272	0.093	0.045	0.101	0.223	0.039	0.180	0.553	0.404	0.588	0.541	0.356	0.544	0.497	0.596	0.412
	Rear	0.403	0.120	0.221	0.239	0.270	0.153	0.310	0.952	0.676	0.793	0.895	0.778	0.833	0.934	0.913	0.796
	Right	0.154	0.129	-	0.126	0.513	-	0.411	0.691	0.283	0.796	0.667	0.154	0.694	0.565	0.793	0.280
	Left	0.220	-	0.181	0.185	-	0.083	0.095	0.499	0.303	0.220	0.401	0.484	0.315	0.496	0.405	0.487
n 25 / 2	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.760	-	-	-	-	-	-	0.760	0.760	0.760	0.760	0.760	0.760	0.760	0.760	0.760
	Front	0.442	0.093	0.045	0.101	0.223	0.039	0.180	0.723	0.574	0.758	0.711	0.526	0.714	0.667	0.766	0.582
	Rear	0.623	0.120	0.221	0.239	0.270	0.153	0.310	1.172	0.896	1.013	1.115	0.998	1.053	1.154	1.133	1.016
	Right	0.464	0.129	-	0.126	0.513	-	0.411	1.001	0.593	1.106	0.977	0.464	1.004	0.875	1.103	0.590
	Left	0.130	-	0.181	0.185	-	0.083	0.095	0.409	0.213	0.130	0.311	0.394	0.225	0.406	0.315	0.397
n 26	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.140	-	-	-	-	-	-	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Front	0.232	0.093	0.045	0.101	0.223	0.039	0.180	0.513	0.364	0.548	0.501	0.316	0.504	0.457	0.556	0.372
	Rear	0.433	0.120	0.221	0.239	0.270	0.153	0.310	0.982	0.706	0.823	0.925	0.808	0.863	0.964	0.943	0.826
	Right	0.114	0.129	-	0.126	0.513	-	0.411	0.651	0.243	0.756	0.627	0.114	0.654	0.525	0.753	0.240
	Left	0.100	-	0.181	0.185	-	0.083	0.095	0.379	0.183	0.100	0.281	0.364	0.195	0.376	0.285	0.367
n 30	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.000	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Front	0.272	0.093	0.045	0.101	0.223	0.039	0.180	0.553	0.404	0.588	0.541	0.356	0.544	0.497	0.596	0.412
	Rear	0.653	0.120	0.221	0.239	0.270	0.153	0.310	1.202	0.926	1.043	1.145	1.028	1.083	1.184	1.163	1.046
	Right	0.024	0.129	-	0.126	0.513	-	0.411	0.561	0.153	0.666	0.537	0.024	0.564	0.435	0.663	0.150
	Left	0.420	-	0.181	0.185	-	0.083	0.095	0.699	0.503	0.420	0.601	0.684	0.515	0.696	0.605	0.687
n 66	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.770	-	-	-	-	-	-	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770	0.770
	Front	0.342	0.093	0.045	0.101	0.223	0.039	0.180	0.623	0.474	0.658	0.611	0.426	0.614	0.567	0.666	0.482
	Rear	0.673	0.120	0.221	0.239	0.270	0.153	0.310	1.222	0.946	1.063	1.165	1.048	1.103	1.204	1.183	1.066
	Right	0.224	0.129	-	0.126	0.513	-	0.411	0.761	0.353	0.866	0.737	0.224	0.764	0.635	0.863	0.350
	Left	0.000	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
n 71	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.080	-	-	-	-	-	-	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
	Front	0.432	0.093	0.045	0.101	0.223	0.039	0.180	0.713	0.564	0.748	0.701	0.516	0.704	0.657	0.756	0.572
	Rear	0.573	0.120	0.221	0.239	0.270	0.153	0.310	1.122	0.846	0.963	1.065	0.948	1.003	1.104	1.083	0.966
	Right	0.154	0.129	-	0.126	0.513	-	0.411	0.691	0.283	0.796	0.667	0.154	0.694	0.565	0.793	0.280
	Left	0.200	-	0.181	0.185	-	0.083	0.095	0.479	0.283	0.200	0.381	0.464	0.295	0.476	0.385	0.467
n 38	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	0.140	-	-	-	-	-	-	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	Front	0.242	0.093	0.045	0.101	0.223	0.039	0.180	0.523	0.374	0.558	0.511	0.326	0.514	0.467	0.566	0.382
	Rear	0.543	0.120	0.221	0.239	0.270	0.153	0.310	1.092	0.816	0.933	1.035	0.918	0.973	1.074	1.053	0.936

	Right	0.564	0.129	-	0.126	0.513	-	0.411	1.101	0.693	1.206	1.077	0.564	1.104	0.975	1.203	0.690
	Left	0.060	-	0.181	0.185	-	0.083	0.095	0.339	0.143	0.060	0.241	0.324	0.155	0.336	0.245	0.327
n 41	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.322	0.093	0.045	0.101	0.223	0.039	0.180	0.603	0.454	0.638	0.591	0.406	0.594	0.547	0.646	0.462
	Rear	0.523	0.120	0.221	0.239	0.270	0.153	0.310	1.072	0.796	0.913	1.015	0.898	0.953	1.054	1.033	0.916
	Right	0.024	0.129	-	0.126	0.513	-	0.411	0.561	0.153	0.666	0.537	0.024	0.564	0.435	0.663	0.150
	Left	0.500	-	0.181	0.185	-	0.083	0.095	0.779	0.583	0.500	0.681	0.764	0.595	0.776	0.685	0.767
n 41 HPUE	Top	0.023	0.097	0.003	0.089	0.057	0.011	0.070	0.181	0.130	0.177	0.083	0.036	0.189	0.095	0.169	0.122
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.412	0.093	0.045	0.101	0.223	0.039	0.180	0.693	0.544	0.728	0.681	0.496	0.684	0.637	0.736	0.552
	Rear	0.663	0.120	0.221	0.239	0.270	0.153	0.310	1.212	0.936	1.053	1.155	1.038	1.093	1.194	1.173	1.056
	Right	0.024	0.129	-	0.126	0.513	-	0.411	0.561	0.153	0.666	0.537	0.024	0.564	0.435	0.663	0.150
	Left	0.530	-	0.181	0.185	-	0.083	0.095	0.809	0.613	0.530	0.711	0.794	0.625	0.806	0.715	0.797
n 48	Top	0.083	0.097	0.003	0.089	0.057	0.011	0.070	0.241	0.190	0.237	0.143	0.096	0.249	0.155	0.229	0.182
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.102	0.093	0.045	0.101	0.223	0.039	0.180	0.383	0.234	0.418	0.371	0.186	0.374	0.327	0.426	0.242
	Rear	0.433	0.120	0.221	0.239	0.270	0.153	0.310	0.982	0.706	0.823	0.925	0.808	0.863	0.964	0.943	0.826
	Right	0.314	0.129	-	0.126	0.513	-	0.411	0.851	0.443	0.956	0.827	0.314	0.854	0.725	0.953	0.440
	Left	-	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
n 77 / 78 3.45~3.55	Top	0.113	0.097	0.003	0.089	0.057	0.011	0.070	0.271	0.220	0.267	0.173	0.126	0.279	0.185	0.259	0.212
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.122	0.093	0.045	0.101	0.223	0.039	0.180	0.403	0.254	0.438	0.391	0.206	0.394	0.347	0.446	0.262
	Rear	0.463	0.120	0.221	0.239	0.270	0.153	0.310	1.012	0.736	0.853	0.955	0.838	0.893	0.994	0.973	0.856
	Right	0.264	0.129	-	0.126	0.513	-	0.411	0.801	0.393	0.906	0.777	0.264	0.804	0.675	0.903	0.390
	Left	-	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267
n 77 / 78 3.70~3.98	Top	0.073	0.097	0.003	0.089	0.057	0.011	0.070	0.231	0.180	0.227	0.133	0.086	0.239	0.145	0.219	0.172
	Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Front	0.112	0.093	0.045	0.101	0.223	0.039	0.180	0.393	0.244	0.428	0.381	0.196	0.384	0.337	0.436	0.252
	Rear	0.443	0.120	0.221	0.239	0.270	0.153	0.310	0.992	0.716	0.833	0.935	0.818	0.873	0.974	0.953	0.836
	Right	0.234	0.129	-	0.126	0.513	-	0.411	0.771	0.363	0.876	0.747	0.234	0.774	0.645	0.873	0.360
	Left	-	-	0.181	0.185	-	0.083	0.095	0.279	0.083	0.000	0.181	0.264	0.095	0.276	0.185	0.267

11.7 Phablet SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required of Hotspot 1g SAR (scaled to maximum output power, including tolerance) < 1.2 W/kg.

Table 11.7.1 Simultaneous Transmission Scenario (Phablet at 0 mm)

Mode	Conf. (Phablet)	NFC + 2G/3G/4G/5G + BT Ant.12 + BT Ant.8	Wi-Fi 5G Ant.8	Wi-Fi 5G Ant.9	Wi-Fi 5G MIMO	Wi-Fi 6G Ant.8	Wi-Fi 6G Ant.9	Wi-Fi 6G MIMO	Σ Phablet SAR (W/kg)					
		1	5	6	7	8	9	10	1+5	1+6	1+7	1+8	1+9	1+10
WCDMA 850	Bottom	3.121	-	-	-	-	-	-	3.121	3.121	3.121	3.121	3.121	3.121
LTE Band 42	Rear	1.973	0.331	0.224	0.253	0.072	0.133	0.157	2.304	2.197	2.226	2.045	2.106	2.130
LTE Band 48	Rear	2.053	0.331	0.224	0.253	0.072	0.133	0.157	2.384	2.277	2.306	2.125	2.186	2.210
n 48	Rear	2.453	0.331	0.224	0.253	0.072	0.133	0.157	2.784	2.677	2.706	2.525	2.586	2.610
	Right	0.671	0.948	0.000	0.893	0.372	0.000	0.417	1.619	0.671	1.564	1.043	0.671	1.088
n 77 / 78 3.45~3.55	Rear	2.433	0.331	0.224	0.253	0.072	0.133	0.157	2.764	2.657	2.686	2.505	2.566	2.590
	Right	0.771	0.948	0.000	0.893	0.372	0.000	0.417	1.719	0.771	1.664	1.143	0.771	1.188
n 77 / 78 3.70~3.98	Rear	1.783	0.331	0.224	0.253	0.072	0.133	0.157	2.114	2.007	2.036	1.855	1.916	1.940
	Right	0.621	0.948	0.000	0.893	0.372	0.000	0.417	1.569	0.621	1.514	0.993	0.621	1.038

Table 11.7.2 Total Exposure Ratio (Phablet)

Mode	Conf. (Phablet)	NFC + 2G/3G/4G/5G + BT Ant.12 + BT Ant.8	Wi-Fi 6G Ant.8	Wi-Fi 6G Ant.9	Wi-Fi 6G MIMO	Phablet TER		
		1	8	9	10	1+8	1+9	1+10
WCDMA 850	Bottom	0.780	-	-	-	0.780	0.780	0.780
LTE Band 42	Rear	0.493	0.076	0.205	0.253	0.569	0.698	0.746
LTE Band 48	Rear	0.513	0.076	0.205	0.253	0.589	0.718	0.766
n 48	Rear	0.613	0.076	0.205	0.253	0.689	0.818	0.866
	Right	0.168	0.385	0.000	0.249	0.553	0.168	0.417
n 77 / 78 3.45~3.55	Rear	0.608	0.076	0.205	0.253	0.684	0.813	0.861
	Right	0.193	0.385	0.000	0.249	0.578	0.193	0.442
n 77 / 78 3.70~3.98	Rear	0.446	0.076	0.205	0.253	0.522	0.651	0.699
	Right	0.155	0.385	0.000	0.249	0.540	0.155	0.405

11.8 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.

12. SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
5. The same procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure to the corresponding SAR thresholds.

12.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for 1g and < 3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

13. EQUIPMENT LIST

Table 13.1 Test Equipment Calibration

	Type	Manufacturer	Model	Cal.Date	Next.Cal.Date	S/N
☒	SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒	SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒	SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒	Robot	SPEAG	TX60L	N/A	N/A	F12/5LP5A1/A/01
☒	Robot	SPEAG	TX90XL	N/A	N/A	F13/5RR2A1/A/01
☒	Robot	SPEAG	TX60L	N/A	N/A	F15/50NHA1/A/01
☒	Robot Controller	SPEAG	CS8C	N/A	N/A	F12/5LP5A1/C/01
☒	Robot Controller	SPEAG	CS8C	N/A	N/A	F13/5RR2A1/C/01
☒	Robot Controller	SPEAG	CS8C	N/A	N/A	F15/50NHA1/C/01
☒	Joystick	SPEAG	N/A	N/A	N/A	S-12030401
☒	Joystick	SPEAG	N/A	N/A	N/A	S-13200990
☒	Joystick	SPEAG	N/A	N/A	N/A	D21142605A
☒	Intel Xeon W-2 255 3.70 GHz Windows 10 Pro	N/A	N/A	N/A	N/A	N/A
☒	Intel Core i7-3 770 3.40 GHz Windows 7 Professional	N/A	N/A	N/A	N/A	N/A
☒	Intel Core i7-8 700K 3.70 GHz Windows 10 Pro	N/A	N/A	N/A	N/A	N/A
☒	Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒	Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒	Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒	Device Holder	SPEAG	SD000H01KA	N/A	N/A	N/A
☒	Device Holder	SPEAG	SD000H01KA	N/A	N/A	N/A
☒	Device Holder	SPEAG	SD000H01KA	N/A	N/A	N/A
☒	mmWave Device Holder	SPEAG	QD 015 050 AA	N/A	N/A	1007
☒	Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1679
☒	Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1785
☒	2mm Oval Phantom ELI5	SPEAG	QDIVA001BB	N/A	N/A	1223
☒	mmWave Phantom	SPEAG	QD 015 025 CA	N/A	N/A	1050
☒	Data Acquisition Electronics	SPEAG	DAE3V1	2023-11-17	2024-11-17	520
☒	Data Acquisition Electronics	SPEAG	DAE4V1	2024-02-16	2025-02-16	1391
☒	Data Acquisition Electronics	SPEAG	DAE4V1	2023-08-23	2024-08-23	1396
☒	Data Acquisition Electronics	SPEAG	DAE4V1	2023-09-20	2024-09-20	1453
☒	Dosimetric E-Field Probe	SPEAG	ES3DV3	2024-01-22	2025-01-22	3327
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	2023-07-17	2024-07-17	3930
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	2024-03-18	2025-03-18	3916
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	2023-10-26	2024-10-26	3933
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	2023-11-27	2024-11-27	7368
☒	E-Field mm-Wave Probe	SPEAG	EUmmWV3	2023-11-16	2024-11-16	9400
☒	Confined Loop Antenna (13 MHz)	SPEAG	CLA13	2023-11-14	2024-11-14	1030
☒	2 450 MHz SAR Dipole	SPEAG	D2450V2	2023-07-19	2025-07-19	726
☒	5 GHz SAR Dipole	SPEAG	D5GHzV2	2023-11-23	2025-11-23	1212
☒	6.5 GHz SAR Dipole	SPEAG	D6.5GHzV2	2023-09-21	2025-09-21	1017
☒	7 GHz SAR Dipole	SPEAG	D7GHzV2	2023-11-16	2025-11-16	1015
☒	Horn Antenna (10 GHz)	SPEAG	5G Verification Source 10 GHz	2024-01-17	2025-01-17	1026
☒	Signal Generator	Agilent	E4438C	2023-06-23	2024-06-23	US41461520
☒	Amplifier	EMPOWER	BBS3Q7ELU	2023-06-23	2024-06-23	1020
☒	High Power RF Amplifier	EMPOWER	BBS3Q8CCJ	2023-06-23	2024-06-23	1005
☒	Power Meter	HP	EPM-442A	2023-12-15	2024-12-15	GB37170267
☒	Power Meter	Anritsu	ML2488B	2023-12-15	2024-12-15	0846003
☒	Power Sensor	Anritsu	MA2472D	2023-12-15	2024-12-15	0845419
☒	Power Sensor	HP	8481A	2023-12-15	2024-12-15	2702A65976
☒	Power Sensor	HP	8481A	2023-12-15	2024-12-15	2702A61707
☒	Directional Coupler	HP	772D	2023-12-15	2024-12-15	2839A00902
☒	Low Pass Filter 3.0 GHz	MICROLAB	LA-30N	2023-06-23	2024-06-23	2
☒	Low Pass Filter 6.0 GHz	MICROLAB	LA-60N	2023-12-15	2024-12-15	03942
☒	Mini Circuits Low Pass Filter DC-8 400 MHz	Mini Circuits	VLF-8400+	2023-12-15	2024-12-15	15542
☒	Attenuators(10 dB)	WEINSCHEL	23-10-34	2023-12-15	2024-12-15	BP4387
☒	Attenuators	Saluki	3.5TS2-3dB-26.5G	2023-06-23	2024-06-23	21090703
☒	Dielectric Probe kit	SPEAG	DAKS-12	2023-09-21	2024-09-21	1040
		SPEAG	R60	2023-09-21	2024-09-21	22323001
☒	Dielectric Probe kit	SPEAG	DAK-3.5	2023-07-17	2024-07-17	1046
		SPEAG	R140	2023-07-31	2024-07-31	0101213

NOTE(S):
1. The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Verification measurement is performed by Dt&C before each test. The brain and muscle simulating material are calibrated by Dt&C using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain and muscle-equivalent material. Each equipment item was used solely within its respective calibration period.
2. CBT(Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

14. MEASUREMENT UNCERTAINTIES

13 MHz SAR (SN: 3933)

Error Description	Uncertainty value %	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (%)	Standard 10 g (%)	Ci x U_i 1 g	Ci x U_i 10 g	Vi or Veff
Measurement System										
Probe calibration	6.7	Normal	1	1	1	6.7	6.7	6.7	6.7	∞
Axial isotropy	4.0	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Hemispherical isotropy	9.6	Rectangular	√3	1	1	5.5	5.5	5.5	5.5	∞
Boundary Effects	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Probe Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Probe modulation response	2.4	Rectangular	√3	1	1	1.4	1.4	1.4	1.4	∞
Detection limits	0.25	Rectangular	√3	1	1	0.14	0.14	0.14	0.14	∞
Readout Electronics	1.0	Normal	1	1	1	1.0	1.0	1.0	1.0	∞
Response time	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	0.23	0.23	∞
Probe Positioning	2.9	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Spatial x-y-Resolution	10.0	Rectangular	√3	1	1	5.8	5.8	5.8	5.8	∞
Fast SAR z-Approximation	7.0	Rectangular	√3	1	1	4.0	4.0	4.0	4.0	∞
Test Sample Related										
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	3.6	3.6	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	2.9	2.9	∞
SAR Scaling	2.0	Rectangular	√3	1	1	1.2	1.2	1.2	1.2	∞
Physical Parameters										
Phantom Shell	7.6	Rectangular	√3	1	1	4.4	4.4	4.4	4.4	∞
Liquid conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	1.8	1.2	1.2	0.5	∞
Liquid conductivity (Meas.)	3.5	Normal	1	0.78	0.71	2.7	2.5	2.1	1.8	10
Liquid permittivity (Target)	5.0	Rectangular	√3	0.60	0.49	1.7	1.4	1.0	0.7	∞
Liquid permittivity (Meas.)	3.8	Normal	1	0.23	0.26	0.87	1.0	0.20	0.26	10
Temp. unc. - Conductivity	1.9	Rectangular	√3	0.78	0.71	0.86	0.78	0.67	0.55	∞
Temp. unc. - Permittivity	2.0	Rectangular	√3	0.23	0.26	0.27	0.30	0.06	0.08	∞
Combined Standard Uncertainty						**14**	**14**			330
Expanded Uncertainty (k=2)						**28**	**28**			

$U(1\ g) = k \cdot u_c$
$= 2 \cdot 14\ \%$
$= 28\ \%$ (The confidence level is about 95 % $k = 2$)
$U(10\ g) = k \cdot u_c$
$= 2 \cdot 14\%$
$= 28\%$ (The confidence level is about 95 % $k = 2$)

750 ~ 2 600 MHz SAR (SN: 3327)

Error Description	Uncertainty value %	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (%)	Standard 10 g (%)	Ci x U_i 1 g	Ci x U_i 10 g	Vi or Veff
Measurement System										
Probe calibration	6.0	Normal	1	1	1	6.0	6.0	6.0	6.0	∞
Axial isotropy	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Hemispherical isotropy	9.6	Rectangular	√3	1	1	5.5	5.5	5.5	5.5	∞
Boundary Effects	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Probe Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Probe modulation response	2.4	Rectangular	√3	1	1	1.4	1.4	1.4	1.4	∞
Detection limits	0.3	Rectangular	√3	1	1	0.14	0.14	0.14	0.14	∞
Readout Electronics	1.0	Normal	1	1	1	1.0	1.0	1.0	1.0	∞
Response time	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	0.23	0.23	∞
Probe Positioning	2.9	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Spatial x-y-Resolution	10.0	Rectangular	√3	1	1	5.8	5.8	5.8	5.8	∞
Fast SAR z-Approximation	7.0	Rectangular	√3	1	1	4.0	4.0	4.0	4.0	∞
Test Sample Related										
Device Positioning	3.3	Normal	1	1	1	3.3	3.3	3.3	3.3	145
Device Holder	2.4	Normal	1	1	1	2.4	2.4	2.4	2.4	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	2.9	2.9	∞
SAR Scaling	2.0	Rectangular	√3	1	1	1.2	1.2	1.2	1.2	∞
Physical Parameters										
Phantom Shell	7.6	Rectangular	√3	1	1	4.4	4.4	4.4	4.4	∞
Liquid conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	1.8	1.2	1.2	0.5	∞
Liquid conductivity (Meas.)	3.3	Normal	1	0.78	0.71	2.6	2.3	2.0	1.7	10
Liquid permittivity (Target)	5.0	Rectangular	√3	0.60	0.49	1.7	1.4	1.0	0.7	∞
Liquid permittivity (Meas.)	3.2	Normal	1	0.23	0.26	0.74	0.8	0.17	0.22	10
Temp. unc. - Conductivity	2.0	Rectangular	√3	0.78	0.71	0.90	0.82	0.70	0.58	∞
Temp. unc. - Permittivity	2.0	Rectangular	√3	0.23	0.26	0.27	0.30	0.06	0.08	∞
Combined Standard Uncertainty						**14**	**14**			330
Expanded Uncertainty (k=2)						**28**	**28**			

$U(1\ g) = k \cdot u_c$
$= 2 \cdot 14$ %
= 28 % (The confidence level is about 95 % $k = 2$)
$U(10\ g) = k \cdot u_c$
$= 2 \cdot 14$ %
= 28 % (The confidence level is about 95 % $k = 2$)

1 450 ~ 2 600 MHz SAR (SN: 3930, 3916)

Error Description	Uncertainty value %	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (%)	Standard 10 g (%)	Ci x U_i 1 g	Ci x U_i 10 g	Vi or Veff
Measurement System										
Probe calibration	6.0	Normal	1	1	1	6.0	6.0	6.0	6.0	∞
Axial isotropy	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Hemispherical isotropy	9.6	Rectangular	√3	1	1	5.5	5.5	5.5	5.5	∞
Boundary Effects	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Probe Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Probe modulation response	2.4	Rectangular	√3	1	1	1.4	1.4	1.4	1.4	∞
Detection limits	0.25	Rectangular	√3	1	1	0.14	0.14	0.14	0.14	∞
Readout Electronics	1.0	Normal	1	1	1	1.0	1.0	1.0	1.0	∞
Response time	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.8	1.8	1.8	1.8	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.8	1.8	1.8	1.8	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	0.23	0.23	∞
Probe Positioning	2.9	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Spatial x-y-Resolution	10.0	Rectangular	√3	1	1	5.8	5.8	5.8	5.8	∞
Fast SAR z-Approximation	7.0	Rectangular	√3	1	1	4.0	4.0	4.0	4.0	∞
Test Sample Related										
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	3.6	3.6	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	2.9	2.9	∞
SAR Scaling	2.0	Rectangular	√3	1	1	1.2	1.2	1.2	1.2	∞
Physical Parameters										
Phantom Shell	7.6	Rectangular	√3	1	1	4.4	4.4	4.4	4.4	∞
Liquid conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	1.8	1.2	1.2	0.5	∞
Liquid conductivity (Meas.)	4.2	Normal	1	0.78	0.71	3.3	3.0	2.4	2.0	10
Liquid permittivity (Target)	5.0	Rectangular	√3	0.60	0.49	1.7	1.4	1.0	0.7	∞
Liquid permittivity (Meas.)	4.0	Normal	1	0.23	0.26	0.92	1.0	0.21	0.26	10
Temp. unc. - Conductivity	2.1	Rectangular	√3	0.78	0.71	0.95	0.86	0.67	0.55	∞
Temp. unc. - Permittivity	2.1	Rectangular	√3	0.23	0.26	0.28	0.32	0.06	0.08	∞
Combined Standard Uncertainty						**13**	**13**			330
Expanded Uncertainty (k=2)						**26**	**26**			

$U(1\ g) = k \cdot u_c$
= 2 . 13 %
= 26 % (The confidence level is about 95 % k = 2)
$U(10\ g) = k \cdot u_c$
= 2 . 13 %
= 26 % (The confidence level is about 95 % k = 2)

3 500 ~ 5 800 MHz SAR (SN: 3933)

Error Description	Uncertainty value %	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (%)	Standard 10 g (%)	Ci x U_i 1 g	Ci x U_i 10 g	Vi or Veff
Measurement System										
Probe calibration	6.6	Normal	1	1	1	6.6	6.6	6.6	6.6	∞
Axial isotropy	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Hemispherical isotropy	9.6	Rectangular	√3	1	1	5.5	5.5	5.5	5.5	∞
Boundary Effects	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Probe Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Probe modulation response	2.4	Rectangular	√3	1	1	1.4	1.4	1.4	1.4	∞
Detection limits	0.25	Rectangular	√3	1	1	0.14	0.14	0.14	0.14	∞
Readout Electronics	1.0	Normal	1	1	1	1.0	1.0	1.0	1.0	∞
Response time	0.8	Rectangular	√3	1	1	0.46	0.46	0.46	0.46	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.8	1.8	1.8	1.8	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.8	1.8	1.8	1.8	∞
Probe Positioner	0.4	Rectangular	√3	1	1	0.23	0.23	0.23	0.23	∞
Probe Positioning	2.9	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Spatial x-y-Resolution	10.0	Rectangular	√3	1	1	5.8	5.8	5.8	5.8	∞
Fast SAR z-Approximation	7.0	Rectangular	√3	1	1	4.0	4.0	4.0	4.0	∞
Test Sample Related										
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	3.6	3.6	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	2.9	2.9	∞
SAR Scaling	2.0	Rectangular	√3	1	1	1.2	1.2	1.2	1.2	∞
Physical Parameters										
Phantom Shell	7.6	Rectangular	√3	1	1	4.4	4.4	4.4	4.4	∞
Liquid conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	1.8	1.2	1.2	0.5	∞
Liquid conductivity (Meas.)	3.8	Normal	1	0.78	0.71	3.0	2.7	2.3	1.9	10
Liquid permittivity (Target)	5.0	Rectangular	√3	0.60	0.49	1.7	1.4	1.0	0.7	∞
Liquid permittivity (Meas.)	3.9	Normal	1	0.23	0.26	0.90	1.0	0.21	0.26	10
Temp. unc. - Conductivity	2.0	Rectangular	√3	0.78	0.71	0.90	0.82	0.70	0.58	∞
Temp. unc. - Permittivity	1.8	Rectangular	√3	0.23	0.26	0.24	0.27	0.05	0.07	∞
Combined Standard Uncertainty						**14**	**13**			330
Expanded Uncertainty (k=2)						**28**	**26**			

$U(1\ g) = k \cdot u_c$
$= 2 \cdot 14$ %
= 28 % (The confidence level is about 95 % $k = 2$)
$U(10\ g) = k \cdot u_c$
$= 2 \cdot 13$ %
= 26 % (The confidence level is about 95 % $k = 2$)

6 500 MHz SAR (SN: 7368)

Error Description	Uncertainty value %	Probability Distribution	Divisor	(Ci) 1 g	(Ci) 10 g	Standard 1 g (%)	Standard 10 g (%)	Ci x U_i 1 g	Ci x U_i 10 g	Vi
Measurement System										
Probe calibration	9.3	Normal	1	1	1	9.3	9.3	9.3	9.3	∞
Axial isotropy	4.7	Rectangular	√3	1	1	1.9	1.9	1.9	1.9	∞
Hemispherical isotropy	9.6	Rectangular	√3	1	1	3.9	3.9	3.9	3.9	∞
Boundary Effects	2.0	Rectangular	√3	1	1	1.2	1.2	1.2	1.2	∞
Probe Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	2.7	2.7	∞
Probe modulation response	2.4	Rectangular	√3	1	1	1.4	1.4	1.4	1.4	∞
Detection limits	1.0	Rectangular	√3	1	1	0.6	0.6	0.6	0.6	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	0.3	0.3	∞
Response time	0.8	Rectangular	√3	1	1	0.5	0.5	0.5	0.5	∞
Integration time	2.6	Rectangular	√3	1	1	1.5	1.5	1.5	1.5	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	1.7	1.7	∞
Probe Positioner	0.04	Rectangular	√3	1	1	0.0	0.0	0.0	0.0	∞
Probe Positioning	1.6	Rectangular	√3	1	1	0.9	0.9	0.9	0.9	∞
Inter/Extrapolation and Averaging	6.0	Rectangular	√3	1	1	3.5	3.5	3.5	3.8	∞
Test Sample Related										
Device Positioning	2.9	Normal	1	1	1	2.9	2.9	2.9	2.9	145
Device Holder	3.6	Normal	1	1	1	3.6	3.6	3.6	3.6	5
Power Drift	5.0	Rectangular	√3	1	1	2.9	2.9	2.9	2.9	∞
SAR Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	0.0	0.0	∞
Physical Parameters										
Phantom Uncertainty	6.6	Rectangular	√3	1	1	3.8	3.8	3.8	3.8	∞
SAR correction	1.9	Normal	1	1	1	1.9	1.9	1.9	1.9	∞
Liquid conductivity (Meas.)	2.5	Normal	1	0.78	0.71	2.0	1.8	1.6	1.3	10
Liquid permittivity (Meas.)	2.5	Normal	1	0.23	0.26	0.6	0.7	0.2	0.2	10
Temp. unc. - Conductivity	3.4	Rectangular	√3	0.78	0.71	1.5	1.4	1.2	1.0	∞
Temp. unc. - Permittivity	0.4	Rectangular	√3	0.23	0.26	0.1	0.1	0.02	0.03	∞
Combined Standard Uncertainty						**14**	**14**			330
Expanded Uncertainty (k=2)						**28**	**28**			

$U(1\ g) = k \cdot u_c$
$= 2 \cdot 14\ \%$
$= 28\ \%$ (The confidence level is about 95 % $k = 2$)
$U(10\ g) = k \cdot u_c$
$= 2 \cdot 14\%$
$= 28\%$ (The confidence level is about 95 % $k = 2$)

6 500 MHz APD (SN: 7368)

Symbol	Error Description	Uncertainty value	Probability Distribution	Divisor	(Ci) (1 g) / (1 cm²)	(Ci) (8 g/10 g) / (4 cm²)	Std. Unc. (1 g) / (1 cm²)	Std. Unc. (8 g/10 g) / (4 cm²)
psSAR	Module SAR V16.2 (Table 6.3.3)	±14.2/14.1%	Normal	1	1	1	±14.2%	±14.1%
PDC	Power Density Conversion	±13.5%	Rectangular	√3	1	1	±7.8%	±7.8%
u(∆SAR)	Combined Uncertainty						±16.2%	±16.9%
U	**Expanded Uncertainty** In dB						±32.4% ±1.2dB	±32.2% ±1.2dB

6 500 MHz Incident Power Density (SN: 9400)

Error Description	Unc. (± dB)	Probability Distribution	Divisor	(Ci)	U_i (± dB)	Vi
Measurement System						
Calibration	0.49	Normal	1	1	0.49	∞
Probe corection	0.00	Rectangular	√3	1	0.00	∞
Frequency response (BW =<1GHz)	0.20	Rectangular	√3	1	0.12	∞
Sensor cross coupling	0.00	Rectangular	√3	1	0.00	∞
Isotropy	0.50	Rectangular	√3	1	0.29	∞
Linearity	0.20	Rectangular	√3	1	0.12	∞
Probe scatering	0.00	Rectangular	1	1	0.00	∞
Probe positioning offset	0.30	Rectangular	√3	1	0.17	∞
Probe positioning repeatability	0.04	Rectangular	√3	1	0.02	∞
Sensor mechanical offset	0.00	Rectangular	√3	1	0.00	∞
Probe spatial resolution	0.00	Rectangular	√3	1	0.00	∞
Field impedance dependance	0.00	Rectangular	√3	1	0.00	∞
Measurement drift	0.05	Rectangular	√3	1	0.03	∞
Amplitude and phase noise	0.04	Rectangular	√3	1	0.02	∞
Measurement area truncation	0.00	Rectangular	√3	1	0.00	∞
Data acquisition	0.03	Normal	1	1	0.03	∞
Sampling	0.00	Rectangular	√3	1	0.00	∞
Field reconstruction	0.60	Rectangular	√3	1	0.35	∞
Signal-to-Noise Ratio	0.00	Rectangular	√3	1	0.00	∞
FTE/MEO	0.00	Rectangular	√3	1	0.00	∞
Power density scaling	-	Rectangular	√3	1	-	∞
Spatial averaging	0.10	Rectangular	√3	1	0.06	∞
Test Sample Related						
Probe coupling with DUT	0.00	Rectangular	√3	1	0.00	∞
Modulation response	0.40	Rectangular	√3	1	0.23	∞
Integration time	0.00	Rectangular	√3	1	0.00	∞
Response time	0.00	Rectangular	√3	1	0.00	∞
Device holder influence	0.10	Rectangular	√3	1	0.06	∞
DUT alignment	0.00	Rectangular	√3	1	0.00	∞
RF ambient conditions	0.04	Rectangular	√3	1	0.02	∞
Laboratory Temperature	0.05	Rectangular	√3	1	0.03	∞
Laboratory Reflections	0.04	Rectangular	√3	1	0.02	∞
Immunity/secondary reception	0.00	Rectangular	√3	1	0.00	∞
Driftofthe DUT	-	Rectangular	√3	1	0.00	∞
Combined Standard Uncertainty					**0.75**	∞
Expanded Uncertainty (k=2)					**1.51**	

15. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under the worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are every complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role impossible biological effect are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease).

Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

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APPENDIX A. – Probe Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **Dt&C**
Gyeonggi-do, Republic of Korea

Certificate No. **ES-3327_Jan24**

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3327
Calibration procedure(s)	QA CAL-01.v10, QA CAL-12.v10, QA CAL-23.v6, QA CAL-25.v8 Calibration procedure for dosimetric E-field probes
Calibration date	January 22, 2024

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
OCP DAK-3.5 (weighted)	SN: 1249	05-Oct-23 (OCP-DAK3.5-1249_Oct23)	Oct-24
OCP DAK-12	SN: 1016	05-Oct-23 (OCP-DAK12-1016_Oct23)	Oct-24
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
DAE4	SN: 660	16-Mar-23 (No. DAE4-660_Mar23)	Mar-24
Reference Probe EX3DV4	SN: 7349	03-Nov-23 (No. EX3-7349_Nov23)	Nov-24

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by	Joanna Lleshaj	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: January 22, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z*: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z*: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- *PAR*: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters*: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

ES3DV3 - SN:3327 January 22, 2024

Parameters of Probe: ES3DV3 - SN:3327

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu V/(V/m)^2$) [A]	1.12	1.14	1.08	±10.1%
DCP (mV) [B]	105.0	104.8	106.1	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc[E] k = 2
0	CW	X	0.00	0.00	1.00	0.00	146.5	±0.7%	±4.7%
		Y	0.00	0.00	1.00		129.3		
		Z	0.00	0.00	1.00		146.1		
10352	Pulse Waveform (200Hz, 10%)	X	20.00	93.91	25.00	10.00	60.0	±1.2%	±9.6%
		Y	20.00	93.87	25.04		60.0		
		Z	20.00	94.07	24.01		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	93.80	23.47	6.99	80.0	±1.0%	±9.6%
		Y	20.00	93.79	23.49		80.0		
		Z	20.00	94.21	22.83		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	20.00	95.60	22.63	3.98	95.0	±1.4%	±9.6%
		Y	20.00	95.20	22.42		95.0		
		Z	20.00	96.60	22.47		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	99.33	22.93	2.22	120.0	±1.6%	±9.6%
		Y	20.00	97.94	22.20		120.0		
		Z	20.00	100.62	22.99		120.0		
10387	QPSK Waveform, 1 MHz	X	1.75	66.61	15.25	1.00	150.0	±2.2%	±9.6%
		Y	1.60	65.03	14.21		150.0		
		Z	1.62	65.91	14.64		150.0		
10388	QPSK Waveform, 10 MHz	X	2.33	68.67	15.98	0.00	150.0	±1.2%	±9.6%
		Y	2.10	66.86	14.90		150.0		
		Z	2.14	67.50	15.35		150.0		
10396	64-QAM Waveform, 100 kHz	X	3.25	72.08	19.55	3.01	150.0	±0.7%	±9.6%
		Y	3.12	71.24	19.00		150.0		
		Z	3.16	72.81	19.87		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.45	66.91	15.62	0.00	150.0	±1.4%	±9.6%
		Y	3.46	66.80	15.41		150.0		
		Z	3.47	67.05	15.61		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.80	65.44	15.36	0.00	150.0	±2.9%	±9.6%
		Y	4.67	64.92	15.00		150.0		
		Z	4.64	65.09	15.12		150.0		

Note: For details on UID parameters see Appendix.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 5).
[B] Linearization parameter uncertainty for maximum specified field strength.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Parameters of Probe: ES3DV3 - SN:3327

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms V^{-2}$	T2 $ms V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	48.5	341.24	34.11	27.80	1.82	5.10	1.05	0.29	1.01
y	48.0	338.33	34.09	27.67	1.88	5.10	1.36	0.24	1.01
z	43.3	302.70	33.69	23.96	0.98	5.10	1.94	0.04	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-38.6°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Parameters of Probe: ES3DV3 - SN:3327

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz)[C]	Relative Permittivity[F]	Conductivity[F] (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unc (k = 2)
750	41.9	0.89	6.22	5.92	5.82	0.33	2.18	±12.0%
835	41.5	0.90	6.23	5.83	5.77	0.32	2.18	±12.0%
900	41.5	0.97	6.09	5.85	5.74	0.32	2.18	±12.0%
1750	40.1	1.37	5.65	5.42	5.24	0.21	2.38	±12.0%
1900	40.0	1.40	5.47	5.25	5.09	0.38	1.91	±12.0%
2450	39.2	1.80	4.96	4.76	4.64	0.27	2.19	±12.0%
2600	39.0	1.96	4.89	4.68	4.58	0.35	1.82	±12.0%

[C] Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.
[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for ε and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 - 3 GHz and 13.1% for 3 - 6 GHz.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.