Conducted Power (Full)					
UNII-6 Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ax HE20	97	6435	9.76	9.89	12.84
	101	6455	9.83	9.76	12.81
	105	6475	9.91	9.85	12.89
	109	6495	9.85	9.91	12.89
	113	6515	9.85	9.73	12.8
	117	6535	9.76	9.82	12.8
802.11ax HE40	99	6445	9.83	9.84	12.85
	107	6485	9.76	9.89	12.84
	115	6525	9.81	9.86	12.85
802.11ax HE80	103	6465	9.86	6.93	11.65
	119	6545	9.83	9.87	12.86
802.11ax HE160	111	6505	9.72	9.89	12.82
802.11be HE20	97	6435	9.88	9.89	12.9
	101	6455	9.81	9.91	12.87
	105	6475	9.76	9.93	12.86
	109	6495	9.84	9.88	12.87
	113	6515	9.85	9.86	12.87
	117	6535	9.71	9.91	12.82
802.11be HE40	99	6445	9.86	9.82	12.85
	107	6485	9.88	9.79	12.85
	115	6525	9.75	9.86	12.82
802.11be HE80	103	6465	9.82	9.85	12.85
	119	6545	9.81	9.85	12.84
802.11be HE160	111	6505	9.88	9.95	12.93

Conducted Power (Full)			
UNII-7 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	149	6695	9.56
	153	6715	9.43
	157	6735	9.41
	161	6755	9.47
	165	6775	9.45
	169	6795	9.59
	173	6815	9.53
	177	6835	9.66
	181	6855	9.61
	185	6875	9.62
802.11ax HE40	123	6565	9.63
	131	6605	9.55
	139	6645	9.45
	147	6685	9.31
	155	6725	9.46
	163	6765	9.34
	171	6805	9.35
	179	6845	9.38
	187	6885	9.61
802.11ax HE80	135	6625	9.43
	151	6705	9.53
	167	6785	9.65
	183	6865	9.63
802.11ax HE160	143	6665	9.35
	175	6825	9.73
802.11be HE20	121	6555	9.46
	125	6575	9.55
	129	6595	9.59
	133	6615	9.35
	137	6635	9.62
	141	6655	9.41
	145	6675	9.63
	149	6695	9.44
	153	6715	9.58
	157	6735	9.32
	161	6755	9.82
	165	6775	9.47
	169	6795	9.28
	173	6815	9.43
	177	6835	9.38
	181	6855	9.45
	185	6875	9.31
802.11be HE40	123	6565	9.76
	131	6605	9.73
	139	6645	9.81
	147	6685	9.57
	155	6725	9.67
	163	6765	9.69
	171	6805	9.63
	179	6845	9.76
	187	6885	9.61
802.11be HE80	135	6625	9.62
	151	6705	9.83
	167	6785	9.85
	183	6865	9.58
802.11be HE160	143	6665	9.65
	175	6825	9.71
802.11be HE320	127	6585	9.86
	159	6745	9.79

Conducted Power (Full)			
UNII-7 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	149	6695	9.89
	153	6715	9.96
	157	6735	9.91
	161	6755	9.39
	165	6775	9.85
	169	6795	9.43
	173	6815	9.96
	177	6835	9.85
	181	6855	9.37
	185	6875	9.85
802.11ax HE40	123	6565	9.37
	131	6605	9.58
	139	6645	9.53
	147	6685	9.94
	155	6725	9.83
	163	6765	9.95
	171	6805	9.73
	179	6845	9.57
	187	6885	9.75
802.11ax HE80	135	6625	9.79
	151	6705	9.88
	167	6785	9.71
	183	6865	9.86
802.11ax HE160	143	6665	9.78
	175	6825	9.89
802.11be HE20	121	6555	9.47
	125	6575	9.62
	129	6595	9.61
	133	6615	9.74
	137	6635	9.62
	141	6655	9.51
	145	6675	9.96
	149	6695	9.54
	153	6715	9.97
	157	6735	9.74
	161	6755	9.83
	165	6775	9.95
	169	6795	9.89
	173	6815	9.91
	177	6835	9.77
	181	6855	9.68
	185	6875	9.95
802.11be HE40	123	6565	9.97
	131	6605	9.81
	139	6645	9.74
	147	6685	9.84
	155	6725	9.74
	163	6765	9.77
	171	6805	9.81
	179	6845	9.67
	187	6885	9.73
802.11be HE80	135	6625	9.81
	151	6705	9.84
	167	6785	9.88
	183	6865	9.66
802.11be HE160	143	6665	9.92
	175	6825	9.62
802.11be HE320	127	6585	9.98
	159	6745	9.92

Conducted Power (Full)					
UNII-7 Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ax HE20	149	6695	9.69	9.78	12.75
	153	6715	9.76	9.83	12.81
	157	6735	9.75	9.89	12.83
	161	6755	9.71	9.83	12.78
	165	6775	9.73	9.85	12.8
	169	6795	9.76	9.86	12.82
	173	6815	9.74	9.83	12.8
	177	6835	9.79	9.85	12.83
	181	6855	6.86	9.78	11.57
	185	6875	6.83	9.86	11.61
802.11ax HE40	123	6565	6.87	9.85	11.62
	131	6605	9.75	9.81	12.79
	139	6645	9.68	9.73	12.72
	147	6685	9.81	9.85	12.84
	155	6725	9.73	9.84	12.8
	163	6765	9.78	9.89	12.85
	171	6805	9.76	9.85	12.82
	179	6845	9.81	9.83	12.83
	187	6885	9.72	9.87	12.81
802.11ax HE80	135	6625	9.79	9.85	12.83
	151	6705	9.76	9.89	12.84
	167	6785	9.75	9.81	12.79
	183	6865	9.82	9.86	12.85
802.11ax HE160	143	6665	9.66	9.78	12.73
	175	6825	9.75	9.71	12.74
802.11be HE20	121	6555	9.64	9.79	12.73
	125	6575	9.82	9.86	12.85
	129	6595	9.76	9.88	12.83
	133	6615	9.62	9.75	12.7
	137	6635	9.71	9.83	12.78
	141	6655	9.76	9.92	12.85
	145	6675	9.77	9.84	12.82
	149	6695	9.69	9.78	12.75
	153	6715	9.73	9.89	12.82
	157	6735	9.89	9.93	12.92
	161	6755	9.64	9.87	12.77
	165	6775	9.72	9.85	12.8
	169	6795	9.65	9.79	12.73
	173	6815	9.78	9.89	12.85
	177	6835	9.77	9.83	12.81
	181	6855	9.59	9.88	12.75
	185	6875	9.61	9.76	12.7
802.11be HE40	123	6565	9.69	9.81	12.76
	131	6605	9.63	9.85	12.75
	139	6645	9.79	9.89	12.85
	147	6685	9.73	9.86	12.81
	155	6725	9.82	9.85	12.85
	163	6765	9.71	9.86	12.8
	171	6805	9.78	9.89	12.85
	179	6845	9.75	9.84	12.81
	187	6885	9.76	9.83	12.81
802.11be HE80	135	6625	9.73	9.87	12.81
	151	6705	9.78	9.89	12.85
	167	6785	9.76	9.88	12.83
	183	6865	9.71	9.83	12.78
802.11be HE160	143	6665	9.72	9.85	12.8
	175	6825	9.79	9.87	12.84
802.11be HE320	127	6585	9.89	9.94	12.93
	159	6745	9.81	9.84	12.84

Conducted Power (Full)			
UNII-8 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	189	6895	9.61
	193	6915	9.67
	197	6935	9.73
	201	6955	9.59
	205	6975	9.64
	209	6995	9.68
	213	7015	9.66
	217	7035	9.72
	221	7055	9.62
	225	7075	9.77
	229	7095	9.61
	233	7115	9.63
802.11ax HE40	195	6925	9.68
	203	6965	9.73
	211	7005	9.75
	219	7045	9.81
	227	7085	9.66
802.11ax HE80	199	6945	9.71
	215	7025	9.75
802.11ax HE160	207	6985	9.79
802.11be HE20	189	6895	9.54
	193	6915	9.67
	197	6935	9.74
	201	6955	9.83
	205	6975	9.65
	209	6995	9.69
	213	7015	9.61
	217	7035	9.57
	221	7055	9.68
	225	7075	9.78
	229	7095	9.77
	233	7115	9.71
802.11be HE40	195	6925	9.63
	203	6965	9.74
	211	7005	9.64
	219	7045	9.62
	227	7085	9.59
802.11be HE80	199	6945	9.67
	215	7025	9.63
802.11be HE160	207	6985	9.61
802.11be HE320	191	6905	9.81

Conducted Power (Full)			
UNII-8 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	189	6895	9.92
	193	6915	9.87
	197	6935	9.98
	201	6955	9.85
	205	6975	9.91
	209	6995	9.94
	213	7015	9.88
	217	7035	9.88
	221	7055	9.87
	225	7075	9.87
	229	7095	9.91
	233	7115	9.89
802.11ax HE40	195	6925	9.88
	203	6965	9.91
	211	7005	9.93
	219	7045	9.86
	227	7085	9.95
802.11ax HE80	199	6945	9.89
	215	7025	9.93
802.11ax HE160	207	6985	9.91
802.11be HE20	189	6895	9.96
	193	6915	9.93
	197	6935	9.94
	201	6955	9.92
	205	6975	9.96
	209	6995	9.95
	213	7015	9.85
	217	7035	9.87
	221	7055	9.89
	225	7075	9.85
	229	7095	9.86
	233	7115	9.91
802.11be HE40	195	6925	9.95
	203	6965	9.86
	211	7005	9.92
	219	7045	9.92
	227	7085	9.94
802.11be HE80	199	6945	9.98
	215	7025	9.94
802.11be HE160	207	6985	9.85
802.11be HE320	191	6905	9.98

Conducted Power (Full)					
UNII-8 Ant 0+1					
Mode	Channel	Frequency	MIMO Ant 0 Avg. Power	MIMO Ant 1 Avg. Power	MIMO Ant 0+1 Avg. Power
802.11ax HE20	189	6895	9.61	9.78	12.71
	193	6915	9.73	9.81	12.78
	197	6935	9.77	9.83	12.81
	201	6955	9.64	9.79	12.73
	205	6975	9.72	9.83	12.79
	209	6995	9.75	9.82	12.8
	213	7015	9.67	9.78	12.74
	217	7035	9.77	9.86	12.83
	221	7055	9.76	9.85	12.82
	225	7075	9.66	9.75	12.72
	229	7095	9.67	9.79	12.74
	233	7115	9.68	9.81	12.76
802.11ax HE40	195	6925	9.67	9.85	12.77
	203	6965	9.66	9.79	12.74
	211	7005	9.62	9.78	12.71
	219	7045	9.75	9.83	12.8
	227	7085	9.64	9.73	12.7
802.11ax HE80	199	6945	9.68	9.78	12.74
	215	7025	9.73	9.85	12.8
802.11ax HE160	207	6985	9.77	9.81	12.8
802.11be HE20	189	6895	9.76	9.85	12.82
	193	6915	9.66	9.79	12.74
	197	6935	9.62	9.81	12.73
	201	6955	9.79	9.81	12.81
	205	6975	9.75	9.83	12.8
	209	6995	9.73	9.78	12.77
	213	7015	9.69	9.76	12.74
	217	7035	9.65	9.71	12.69
	221	7055	9.67	9.72	12.71
	225	7075	9.73	9.79	12.77
	229	7095	9.69	9.76	12.74
	233	7115	9.69	9.78	12.75
802.11be HE40	195	6925	9.66	9.75	12.72
	203	6965	9.64	9.81	12.74
	211	7005	9.73	9.81	12.78
	219	7045	9.77	9.85	12.82
	227	7085	9.64	9.79	12.73
802.11be HE80	199	6945	9.72	9.78	12.76
	215	7025	9.75	9.83	12.8
802.11be HE160	207	6985	9.67	9.76	12.73
802.11be HE320	191	6905	9.84	9.89	12.88

Conducted Power (LPI)			
UNII-5 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	1	5955	5.6
	5	5975	5.58
	9	5995	5.67
	13	6015	5.51
	17	6035	5.57
	21	6055	5.68
	25	6075	5.57
	29	6095	5.58
	33	6115	5.55
	37	6135	5.65
	41	6155	5.52
	45	6175	5.71
	49	6195	5.66
	53	6215	5.61
	57	6235	5.63
	61	6255	5.59
	65	6275	5.67
	69	6295	5.59
	73	6315	5.55
	77	6335	5.5
	81	6355	5.57
	85	6375	5.51
	89	6395	5.64
	93	6415	5.45
802.11ax HE40	3	5965	8.56
	11	6005	8.47
	19	6045	8.53
	27	6085	8.6
	35	6125	8.55
	43	6165	8.61
	51	6205	8.47
	59	6245	8.45
	67	6285	8.49
	75	6325	8.59
	83	6365	8.46
	91	6405	8.5
802.11ax HE80	7	5985	9.59
	23	6065	9.64
	39	6145	9.58
	55	6225	9.51
	71	6305	9.66
	87	6385	9.42
802.11ax HE160	15	6025	9.45
	47	6185	9.51
	79	6345	9.45

Conducted Power (LPI)			
UNII-5 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11be HE20	1	5955	5.6
	5	5975	5.54
	9	5995	5.57
	13	6015	5.59
	17	6035	5.51
	21	6055	5.41
	25	6075	5.54
	29	6095	5.58
	33	6115	5.39
	37	6135	5.48
	41	6155	5.57
	45	6175	5.71
	49	6195	5.49
	53	6215	5.59
	57	6235	5.6
	61	6255	5.36
	65	6275	5.44
	69	6295	5.56
	73	6315	5.48
	77	6335	5.43
	81	6355	5.36
	85	6375	5.52
	89	6395	5.36
	93	6415	5.45
802.11be HE40	3	5965	8.56
	11	6005	8.45
	19	6045	8.38
	27	6085	8.5
	35	6125	8.42
	43	6165	8.61
	51	6205	8.45
	59	6245	8.46
	67	6285	8.5
	75	6325	8.49
	83	6365	8.39
	91	6405	8.5
802.11be HE80	7	5985	9.38
	23	6065	9.67
	39	6145	9.61
	55	6225	9.63
	71	6305	9.36
	87	6385	9.55
802.11be HE160	15	6025	9.54
	47	6185	9.39
	79	6345	9.56
802.11be HE320	31	6105	9.73
	63	6265	9.69
	95	6425	9.38

Conducted Power (LPI)			
UNII-5 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	1	5955	5.51
	5	5975	5.5
	9	5995	5.5
	13	6015	5.42
	17	6035	5.4
	21	6055	5.51
	25	6075	5.36
	29	6095	5.5
	33	6115	5.39
	37	6135	5.5
	41	6155	5.39
	45	6175	5.56
	49	6195	5.44
	53	6215	5.48
	57	6235	5.49
	61	6255	5.43
	65	6275	5.54
	69	6295	5.48
	73	6315	5.35
	77	6335	5.35
	81	6355	5.41
	85	6375	5.48
	89	6395	5.44
	93	6415	5.38
802.11ax HE40	3	5965	8.43
	11	6005	8.56
	19	6045	8.36
	27	6085	8.42
	35	6125	8.48
	43	6165	8.57
	51	6205	8.32
	59	6245	8.55
	67	6285	8.41
	75	6325	8.33
	83	6365	8.36
	91	6405	8.32
802.11ax HE80	7	5985	9.88
	23	6065	9.96
	39	6145	9.97
	55	6225	9.93
	71	6305	9.88
	87	6385	9.87
802.11ax HE160	15	6025	9.88
	47	6185	9.91
	79	6345	9.93

Conducted Power (LPI)			
UNII-5 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11be HE20	1	5955	5.51
	5	5975	5.3
	9	5995	5.28
	13	6015	5.38
	17	6035	5.44
	21	6055	5.27
	25	6075	5.26
	29	6095	5.39
	33	6115	5.43
	37	6135	5.32
	41	6155	5.37
	45	6175	5.56
	49	6195	5.32
	53	6215	5.36
	57	6235	5.33
	61	6255	5.27
	65	6275	5.31
	69	6295	5.35
	73	6315	5.38
	77	6335	5.33
	81	6355	5.45
	85	6375	5.38
	89	6395	5.26
	93	6415	5.38
802.11be HE40	3	5965	8.43
	11	6005	8.43
	19	6045	8.4
	27	6085	8.27
	35	6125	8.43
	43	6165	8.57
	51	6205	8.39
	59	6245	8.31
	67	6285	8.42
	75	6325	8.26
	83	6365	8.27
	91	6405	8.32
802.11be HE80	7	5985	9.85
	23	6065	9.91
	39	6145	9.94
	55	6225	9.88
	71	6305	9.88
	87	6385	9.87
802.11be HE160	15	6025	9.87
	47	6185	9.91
	79	6345	9.89
802.11be HE320	31	6105	9.98
	63	6265	9.92
	95	6425	9.96

Conducted Power (LPI)			
UNII-5 Ant 0+1			
Mode	Channel	Frequency	MIMO Ant 0+1 Avg. Power
802.11ax HE20	1	5955	5.52
	5	5975	5.36
	9	5995	5.35
	13	6015	5.39
	17	6035	5.33
	21	6055	5.37
	25	6075	5.43
	29	6095	5.41
	33	6115	5.4
	37	6135	5.33
	41	6155	5.41
	45	6175	5.48
	49	6195	5.46
	53	6215	5.41
	57	6235	5.34
	61	6255	5.43
	65	6275	5.4
	69	6295	5.48
	73	6315	5.44
	77	6335	5.42
	81	6355	5.4
	85	6375	5.34
	89	6395	5.38
	93	6415	5.44
802.11ax HE40	3	5965	8.2
	11	6005	8.19
	19	6045	8.08
	27	6085	8.1
	35	6125	8.07
	43	6165	8.06
	51	6205	8.11
	59	6245	8.13
	67	6285	8.01
	75	6325	8.02
	83	6365	8.08
	91	6405	8.08
802.11ax HE80	7	5985	12.78
	23	6065	12.78
	39	6145	12.87
	55	6225	12.88
	71	6305	12.86
	87	6385	12.82
802.11ax HE160	15	6025	12.85
	47	6185	12.82
	79	6345	12.8

Conducted Power (LPI)			
UNII-5 Ant 0+1			
Mode	Channel	Frequency	MIMO Ant 0+1 Avg. Power
802.11be HE20	1	5955	5.52
	5	5975	5.34
	9	5995	5.35
	13	6015	5.27
	17	6035	5.29
	21	6055	5.26
	25	6075	5.26
	29	6095	5.34
	33	6115	5.35
	37	6135	5.33
	41	6155	5.35
	45	6175	5.48
	49	6195	5.46
	53	6215	5.29
	57	6235	5.3
	61	6255	5.38
	65	6275	5.36
	69	6295	5.32
	73	6315	5.31
	77	6335	5.35
	81	6355	5.29
	85	6375	5.35
	89	6395	5.32
	93	6415	5.44
802.11be HE40	3	5965	8.2
	11	6005	8.03
	19	6045	8.01
	27	6085	7.96
	35	6125	8.03
	43	6165	8.06
	51	6205	8.01
	59	6245	7.95
	67	6285	8.02
	75	6325	8.01
	83	6365	8.01
	91	6405	8.08
802.11be HE80	7	5985	12.88
	23	6065	12.91
	39	6145	12.84
	55	6225	12.83
	71	6305	12.81
	87	6385	12.87
802.11be HE160	15	6025	12.83
	47	6185	12.85
	79	6345	12.84
802.11be HE320	31	6105	12.93
	63	6265	12.8
	95	6425	12.78

Conducted Power (LPI)			
UNII-6 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	97	6435	5.18
	101	6455	5.53
	105	6475	5.46
	109	6495	5.55
	113	6515	5.64
	117	6535	5.58
802.11ax HE40	99	6445	8.47
	107	6485	8.59
	115	6525	8.44
802.11ax HE80	103	6465	9.32
	119	6545	9.82
802.11ax HE160	111	6505	9.47
802.11be HE20	97	6435	5.18
	101	6455	5.15
	105	6475	5.46
	109	6495	5.21
	113	6515	5.64
	117	6535	5.58
802.11be HE40	99	6445	8.47
	107	6485	8.59
	115	6525	8.44
802.11be HE80	103	6465	9.41
	119	6545	9.43
802.11be HE160	111	6505	9.39

Conducted Power (LPI)			
UNII-6 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	97	6435	5.43
	101	6455	5.46
	105	6475	5.39
	109	6495	5.49
	113	6515	5.41
	117	6535	5.58
802.11ax HE40	99	6445	8.56
	107	6485	8.54
	115	6525	8.47
802.11ax HE80	103	6465	9.72
	119	6545	9.83
802.11ax HE160	111	6505	9.85
802.11be HE20	97	6435	5.43
	101	6455	5.25
	105	6475	5.39
	109	6495	5.3
	113	6515	5.41
	117	6535	5.58
802.11be HE40	99	6445	8.56
	107	6485	8.54
	115	6525	8.47
802.11be HE80	103	6465	9.79
	119	6545	9.78
802.11be HE160	111	6505	9.81

Conducted Power (LPI)			
UNII-6 Ant 0+1			
Mode	Channel	Frequency	MIMO Ant 0+1 Avg. Power
802.11ax HE20	97	6435	5.38
	101	6455	5.47
	105	6475	5.37
	109	6495	5.42
	113	6515	5.56
	117	6535	5.5
802.11ax HE40	99	6445	8.47
	107	6485	8.07
	115	6525	8.17
802.11ax HE80	103	6465	11.65
	119	6545	12.86
802.11ax HE160	111	6505	12.93
802.11be HE20	97	6435	5.38
	101	6455	5.4
	105	6475	5.37
	109	6495	5.31
	113	6515	5.56
	117	6535	5.5
802.11be HE40	99	6445	8.47
	107	6485	8.07
	115	6525	8.17
802.11be HE80	103	6465	12.85
	119	6545	12.84
802.11be HE160	111	6505	12.82

Conducted Power (LPI)			
UNII-7 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	121	6555	5.5
	125	6575	5.46
	129	6595	5.5
	133	6615	5.51
	137	6635	5.39
	141	6655	5.36
	145	6675	5.51
	149	6695	5.56
	153	6715	5.41
	157	6735	5.44
	161	6755	5.4
	165	6775	5.54
	169	6795	5.44
	173	6815	5.37
	177	6835	5.48
	181	6855	5.54
	185	6875	5.37
802.11ax HE40	123	6565	8.57
	131	6605	8.64
	139	6645	8.44
	147	6685	8.45
	155	6725	8.43
	163	6765	8.52
	171	6805	8.6
	179	6845	8.65
	187	6885	8.53
802.11ax HE80	135	6625	9.43
	151	6705	9.53
	167	6785	9.65
	183	6865	9.63
802.11ax HE160	143	6665	9.35
	175	6825	9.73
802.11be HE20	121	6555	5.45
	125	6575	5.34
	129	6595	5.32
	133	6615	5.27
	137	6635	5.33
	141	6655	5.3
	145	6675	5.27
	149	6695	5.56
	153	6715	5.44
	157	6735	5.4
	161	6755	5.35
	165	6775	5.4
	169	6795	5.41
	173	6815	5.45
	177	6835	5.28
	181	6855	5.54
	185	6875	5.37
802.11be HE40	123	6565	8.39
	131	6605	8.46
	139	6645	8.34
	147	6685	8.45
	155	6725	8.34
	163	6765	8.43
	171	6805	8.43
	179	6845	8.65
	187	6885	8.53
802.11be HE80	135	6625	9.62
	151	6705	9.83
	167	6785	9.85
	183	6865	9.58
802.11be HE160	143	6665	9.65
	175	6825	9.71
802.11be HE320	127	6585	9.86
	159	6745	9.79

Conducted Power (LPI)			
UNII-7 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	121	6555	5.36
	125	6575	5.44
	129	6595	5.48
	133	6615	5.36
	137	6635	5.43
	141	6655	5.39
	145	6675	5.45
	149	6695	5.49
	153	6715	5.39
	157	6735	5.42
	161	6755	5.43
	165	6775	5.37
	169	6795	5.45
	173	6815	5.43
	177	6835	5.47
	181	6855	5.39
	185	6875	5.33
802.11ax HE40	123	6565	8.4
	131	6605	8.37
	139	6645	8.4
	147	6685	8.47
	155	6725	8.46
	163	6765	8.35
	171	6805	8.42
	179	6845	8.37
	187	6885	8.52
802.11ax HE80	135	6625	9.79
	151	6705	9.88
	167	6785	9.71
	183	6865	9.86
802.11ax HE160	143	6665	9.78
	175	6825	9.89
802.11be HE20	121	6555	5.35
	125	6575	5.26
	129	6595	5.37
	133	6615	5.36
	137	6635	5.36
	141	6655	5.28
	145	6675	5.31
	149	6695	5.49
	153	6715	5.25
	157	6735	5.27
	161	6755	5.29
	165	6775	5.36
	169	6795	5.27
	173	6815	5.37
	177	6835	5.35
	181	6855	5.39
	185	6875	5.33
802.11be HE40	123	6565	8.41
	131	6605	8.47
	139	6645	8.46
	147	6685	8.47
	155	6725	8.5
	163	6765	8.42
	171	6805	8.48
	179	6845	8.37
	187	6885	8.52
802.11be HE80	135	6625	9.81
	151	6705	9.84
	167	6785	9.88
	183	6865	9.66
802.11be HE160	143	6665	9.92
	175	6825	9.62
802.11be HE320	127	6585	9.98
	159	6745	9.92

Conducted Power (LPI)			
UNII-7 Ant 0+1			
Mode	Channel	Frequency	MIMO Ant 0+1 Avg. Power
802.11ax HE20	121	6555	5.43
	125	6575	5.41
	129	6595	5.31
	133	6615	5.41
	137	6635	5.4
	141	6655	5.33
	145	6675	5.38
	149	6695	5.44
	153	6715	5.41
	157	6735	5.42
	161	6755	5.36
	165	6775	5.43
	169	6795	5.31
	173	6815	5.33
	177	6835	5.4
	181	6855	5.49
	185	6875	5.4
802.11ax HE40	123	6565	8.64
	131	6605	8.52
	139	6645	8.65
	147	6685	8.56
	155	6725	8.48
	163	6765	8.59
	171	6805	8.57
	179	6845	8.64
	187	6885	8.48
802.11ax HE80	135	6625	12.83
	151	6705	12.84
	167	6785	12.79
	183	6865	12.85
802.11ax HE160	143	6665	12.73
	175	6825	12.74
802.11be HE20	121	6555	5.3
	125	6575	5.29
	129	6595	5.3
	133	6615	5.29
	137	6635	5.28
	141	6655	5.25
	145	6675	5.2
	149	6695	5.44
	153	6715	5.24
	157	6735	5.3
	161	6755	5.33
	165	6775	5.28
	169	6795	5.35
	173	6815	5.3
	177	6835	5.33
	181	6855	5.49
	185	6875	5.4
802.11be HE40	123	6565	8.5
	131	6605	8.5
	139	6645	8.41
	147	6685	8.56
	155	6725	8.4
	163	6765	8.42
	171	6805	8.47
	179	6845	8.64
	187	6885	8.48
802.11be HE80	135	6625	12.81
	151	6705	12.85
	167	6785	12.83
	183	6865	12.78
802.11be HE160	143	6665	12.8
	175	6825	12.84
802.11be HE320	127	6585	12.93
	159	6745	12.84

Conducted Power (LPI)			
UNII-8 Ant 0			
Mode	Channel	Frequency	SISO Ant 0 Avg. Power
802.11ax HE20	189	6895	5.56
	193	6915	5.56
	197	6935	5.44
	201	6955	5.43
	205	6975	5.46
	209	6995	5.56
	213	7015	5.49
	217	7035	5.48
	221	7055	5.47
	225	7075	5.42
	229	7095	5.51
	233	7115	5.58
802.11ax HE40	195	6925	8.5
	203	6965	8.46
	211	7005	8.48
	219	7045	8.5
	227	7085	8.6
802.11ax HE80	199	6945	9.71
	215	7025	9.75
802.11ax HE160	207	6985	9.79
802.11be HE20	189	6895	5.59
	193	6915	5.34
	197	6935	5.49
	201	6955	5.35
	205	6975	5.31
	209	6995	5.6
	213	7015	5.49
	217	7035	5.48
	221	7055	5.41
	225	7075	5.41
	229	7095	5.51
	233	7115	5.39
802.11be HE40	195	6925	8.48
	203	6965	8.46
	211	7005	8.35
	219	7045	8.35
	227	7085	8.6
802.11be HE80	199	6945	9.67
	215	7025	9.63
802.11be HE160	207	6985	9.61
802.11be HE320	191	6905	9.81

Conducted Power (LPI)			
UNII-8 Ant 1			
Mode	Channel	Frequency	SISO Ant 1 Avg. Power
802.11ax HE20	189	6895	5.46
	193	6915	5.51
	197	6935	5.52
	201	6955	5.58
	205	6975	5.55
	209	6995	5.59
	213	7015	5.53
	217	7035	5.49
	221	7055	5.53
	225	7075	5.52
	229	7095	5.56
	233	7115	5.5
802.11ax HE40	195	6925	8.73
	203	6965	8.61
	211	7005	8.72
	219	7045	8.69
	227	7085	8.75
802.11ax HE80	199	6945	9.89
	215	7025	9.93
802.11ax HE160	207	6985	9.91
802.11be HE20	189	6895	5.43
	193	6915	5.48
	197	6935	5.36
	201	6955	5.48
	205	6975	5.36
	209	6995	5.59
	213	7015	5.38
	217	7035	5.44
	221	7055	5.42
	225	7075	5.39
	229	7095	5.56
	233	7115	5.39
802.11be HE40	195	6925	8.52
	203	6965	8.58
	211	7005	8.6
	219	7045	8.64
	227	7085	8.75
802.11be HE80	199	6945	9.98
	215	7025	9.94
802.11be HE160	207	6985	9.85
802.11be HE320	191	6905	9.98

Conducted Power (LPI)			
UNII-8 Ant 0+1			
Mode	Channel	Frequency	MIMO Ant 0+1 Avg. Power
802.11ax HE20	189	6895	5.44
	193	6915	5.5
	197	6935	5.54
	201	6955	5.48
	205	6975	5.53
	209	6995	5.52
	213	7015	5.46
	217	7035	5.5
	221	7055	5.52
	225	7075	5.45
	229	7095	5.57
	233	7115	5.5
802.11ax HE40	195	6925	8.69
	203	6965	8.7
	211	7005	8.61
	219	7045	8.62
	227	7085	8.72
802.11ax HE80	199	6945	12.74
	215	7025	12.8
802.11ax HE160	207	6985	12.8
802.11be HE20	189	6895	5.32
	193	6915	5.43
	197	6935	5.33
	201	6955	5.31
	205	6975	5.37
	209	6995	5.52
	213	7015	5.33
	217	7035	5.37
	221	7055	5.37
	225	7075	5.41
	229	7095	5.57
	233	7115	5.44
802.11be HE40	195	6925	8.52
	203	6965	8.56
	211	7005	8.52
	219	7045	8.58
	227	7085	8.72
802.11be HE80	199	6945	12.76
	215	7025	12.8
802.11be HE160	207	6985	12.73
802.11be HE320	191	6905	12.88

Appendix F. SAR and Incident Power Density Test Result

SAR Results for Body Exposure Condition.

Note:
1. SAR testing was performed on the maximum power mode.
2. The “< 0.001” means there is no SAR value or the SAR is too low to be measured.
3. The separation distance between WWAN Ant 0 and bottom of laptop is more than 20 cm, SAR are not required.
4. Per KDB 388624 APPENDIX OVER6G, the minimum of 5 channels to perform IPD across U-NII 5,6,7 and 8. and measured results were scaled by factor 1.545 to reported power density when measurement uncertainty exceed 30%.

Body SAR Test Result

System & Position								DUT Configuration			SAR							
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB#	RB offset	Antenna Manufacturer	Ant Status	Power Reduction	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	LTE 41	QPSK20M	Bottom of Laptop	17	40620	1	0	Speed	Ant 2	w/o	-	1.00	24.00	23.25	1.19	-0.1	0.053	0.06
	LTE 41	QPSK20M	Bottom of Laptop	17	40620	50	0	Speed	Ant 2	w/o	-	1.00	23.00	22.12	1.22	-0.12	0.044	0.05
	LTE 41	QPSK20M	Bottom of Laptop	0	40620	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.89	1.03	-0.03	0.436	0.45
	LTE 41	QPSK20M	Bottom of Laptop	0	40620	50	0	Speed	Ant 2	w/	-	1.00	16.00	15.86	1.03	-0.05	0.362	0.37
	LTE 41	QPSK20M	Bottom of Laptop	0	39790	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.83	1.04	0.02	0.378	0.39
	LTE 41	QPSK20M	Bottom of Laptop	0	39750	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.73	1.06	-0.15	0.38	0.40
	LTE 41	QPSK20M	Bottom of Laptop	0	40185	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.86	1.03	0.11	0.411	0.42
12	LTE 41	QPSK20M	Bottom of Laptop	0	41055	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.84	1.04	-0.02	0.549	0.57
	LTE 41	QPSK20M	Bottom of Laptop	0	41490	1	0	Speed	Ant 2	w/	-	1.00	17.00	16.69	1.07	0.09	0.501	0.54
	LTE 41 - HPUE	QPSK20M	Bottom of Laptop	17	40620	1	0	Speed	Ant 2	w/o	-	1.00	27.00	26.36	1.16	0.19	0.056	0.06
	LTE 41	QPSK20M	Bottom of Laptop	0	41055	1	0	WNC	Ant 2	w/	-	1.00	17.00	16.84	1.04	0.13	0.538	0.56
	LTE 42	QPSK20M	Bottom of Laptop	17	43340	1	0	Speed	Ant 2	w/o	-	1.00	24.00	23.49	1.12	0.16	0.068	0.08
	LTE 42	QPSK20M	Bottom of Laptop	17	43340	50	0	Speed	Ant 2	w/o	-	1.00	23.00	22.41	1.15	0.14	0.053	0.06
	LTE 42	QPSK20M	Bottom of Laptop	0	43340	1	0	Speed	Ant 2	w/	-	1.00	23.00	22.98	1.00	-0.14	0.424	0.42
	LTE 42	QPSK20M	Bottom of Laptop	0	43340	50	0	Speed	Ant 2	w/	-	1.00	22.00	22.02	1.00	-0.03	0.332	0.33
42	LTE 42	QPSK20M	Bottom of Laptop	0	43190	1	0	Speed	Ant 2	w/	-	1.00	23.00	22.77	1.05	0.05	0.502	0.53
	LTE 42	QPSK20M	Bottom of Laptop	0	43490	1	0	Speed	Ant 2	w/	-	1.00	23.00	22.93	1.02	-0.13	0.383	0.39
	LTE 42	QPSK20M	Bottom of Laptop	0	43190	1	0	WNC	Ant 2	w/	-	1.00	23.00	22.77	1.05	0.01	0.445	0.47
	LTE 43	QPSK20M	Bottom of Laptop	0	44215	1	0	Speed	Ant 2	w/o	-	1.00	24.00	23.42	1.14	-0.12	0.284	0.32
	LTE 43	QPSK20M	Bottom of Laptop	0	44215	50	0	Speed	Ant 2	w/o	-	1.00	23.00	22.37	1.16	0.06	0.244	0.28
	LTE 43	QPSK20M	Bottom of Laptop	0	44190	1	0	Speed	Ant 2	w/o	-	1.00	24.00	23.36	1.16	0.09	0.296	0.34
43	LTE 43	QPSK20M	Bottom of Laptop	0	44240	1	0	Speed	Ant 2	w/o	-	1.00	24.00	23.35	1.16	0.08	0.303	0.35
	LTE 43	QPSK20M	Bottom of Laptop	0	44240	1	99	WNC	Ant 2	w/o	-	1.00	24.00	23.35	1.16	-0.14	0.265	0.31
	LTE 48	QPSK20M	Bottom of Laptop	17	55780	1	0	Speed	Ant 2	w/o	-	1.00	22.00	21.41	1.15	0.19	0.14	0.16
	LTE 48	QPSK20M	Bottom of Laptop	17	55780	50	0	Speed	Ant 2	w/o	-	1.00	21.00	20.43	1.14	0.15	0.115	0.13
	LTE 48	QPSK20M	Bottom of Laptop	0	55780	1	0	Speed	Ant 2	w/	-	1.00	18.50	18.43	1.02	-0.13	0.376	0.38
	LTE 48	QPSK20M	Bottom of Laptop	0	55780	50	0	Speed	Ant 2	w/	-	1.00	17.50	17.32	1.04	-0.07	0.233	0.24
13	LTE 48	QPSK20M	Bottom of Laptop	0	55340	1	99	Speed	Ant 2	w/	-	1.00	18.50	18.26	1.06	0.01	0.488	0.52
	LTE 48	QPSK20M	Bottom of Laptop	0	56210	1	0	Speed	Ant 2	w/	-	1.00	18.50	18.39	1.03	0.15	0.38	0.39
	LTE 48	QPSK20M	Bottom of Laptop	0	56640	1	0	Speed	Ant 2	w/	-	1.00	18.50	18.28	1.05	0.04	0.326	0.34
	LTE 48	QPSK20M	Bottom of Laptop	0	55340	1	99	WNC	Ant 2	w/	-	1.00	18.50	18.26	1.06	0.13	0.452	0.48

Body SAR Test Result

System & Position								DUT Configuration			SAR							
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB#	RB offset	Antenna Manufacturer	Ant Status	Power Reduction	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	17	518598	1	1	Speed	Ant 2	w/o	-	1.00	24.00	23.75	1.06	-0.16	0.091	0.10
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	17	518598	135	69	Speed	Ant 2	w/o	-	1.00	24.00	23.54	1.11	-0.15	0.078	0.09
22	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	518598	1	1	Speed	Ant 2	w/	-	1.00	15.50	14.91	1.15	0.01	0.388	0.45
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	518598	135	69	Speed	Ant 2	w/	-	1.00	15.50	14.71	1.20	0.05	0.277	0.33
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	509202	1	1	Speed	Ant 2	w/	-	1.00	15.50	14.90	1.15	0.17	0.325	0.37
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	513900	1	1	Speed	Ant 2	w/	-	1.00	15.50	14.76	1.19	-0.09	0.317	0.38
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	523302	1	1	Speed	Ant 2	w/	-	1.00	15.50	14.79	1.18	0.1	0.353	0.42
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	528000	1	1	Speed	Ant 2	w/	-	1.00	15.50	14.85	1.16	-0.17	0.359	0.42
	5GNR-n41-HPUE	DFT-s QPSK100M	Bottom of Laptop	17	518598	1	1	Speed	Ant 2	w/o	-	1.00	27.00	25.87	1.30	0.04	0.11	0.14
	5GNR-n41	DFT-s QPSK100M	Bottom of Laptop	0	518598	1	1	WNC	Ant 2	w/	-	1.00	15.50	14.91	1.15	0.06	0.354	0.41
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	17	642888	1	1	Speed	Ant 2	w/o	-	1.00	22.00	21.96	1.01	-0.03	0.125	0.13
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	17	642888	50	28	Speed	Ant 2	w/o	-	1.00	22.00	21.77	1.05	-0.06	0.117	0.12
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	642888	1	1	Speed	Ant 2	w/	-	1.00	18.50	18.48	1.00	-0.03	0.627	0.63
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	642888	50	28	Speed	Ant 2	w/	-	1.00	18.50	18.29	1.05	-0.06	0.603	0.63
39	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	638000	1	1	Speed	Ant 2	w/	-	1.00	18.50	18.28	1.05	-0.02	0.627	0.66
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	640444	1	1	Speed	Ant 2	w/	-	1.00	18.50	18.37	1.03	-0.1	0.606	0.62
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	645332	1	1	Speed	Ant 2	w/	-	1.00	18.50	18.23	1.06	-0.13	0.612	0.65
	5GNR-n48	DFT-s QPSK40M	Bottom of Laptop	0	638000	1	1	WNC	Ant 2	w/	-	1.00	18.50	18.28	1.05	-0.15	0.597	0.63
		-									-						-	-

Body SAR Test Result

System & Position								DUT Configuration			SAR							
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB#	RB offset	Antenna Manufacturer	Ant Status	Power Reduction	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	17	656000	1	1	Speed	Ant 2	w/o	-	1.00	27.00	26.48	1.13	-0.14	0.379	0.43
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	17	656000	135	69	Speed	Ant 2	w/o	-	1.00	27.00	26.35	1.16	0.02	0.362	0.42
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	656000	1	1	Speed	Ant 2	w/	-	1.00	18.00	17.30	1.17	-0.14	0.473	0.55
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	656000	135	69	Speed	Ant 2	w/	-	1.00	18.00	17.17	1.21	0.12	0.417	0.50
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	633332	1	1	Speed	Ant 2	w/	-	1.00	18.00	17.27	1.18	0.05	0.505	0.60
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	640000	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.18	1.21	-0.15	0.485	0.59
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	641666	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.08	1.24	-0.15	0.492	0.61
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	643332	1	1	Speed	Ant 2	w/	-	1.00	18.00	17.25	1.19	0.03	0.472	0.56
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	650000	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.14	1.22	-0.14	0.422	0.51
25	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	653000	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.12	1.22	0.05	0.52	0.63
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	659000	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.18	1.21	0.17	0.494	0.60
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	662000	1	137	Speed	Ant 2	w/	-	1.00	18.00	17.24	1.19	-0.19	0.432	0.51
	5GNR-n77	DFT-s QPSK100M	Bottom of Laptop	0	653000	1	1	WNC	Ant 2	w/	-	1.00	18.00	17.12	1.22	-0.19	0.458	0.56
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	17	650000	1	1	Speed	Ant 2	w/o	-	1.00	27.00	25.62	1.37	0.03	0.301	0.41
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	17	650000	135	69	Speed	Ant 2	w/o	-	1.00	27.00	25.52	1.41	-0.19	0.288	0.41
26	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	650000	1	1	Speed	Ant 2	w/	-	1.00	18.50	17.99	1.12	0.11	0.561	0.63
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	650000	135	69	Speed	Ant 2	w/	-	1.00	18.50	17.89	1.15	0.15	0.495	0.57
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	633332	1	1	Speed	Ant 2	w/	-	1.00	18.50	17.82	1.17	0.18	0.532	0.62
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	640000	1	1	Speed	Ant 2	w/	-	1.00	18.50	17.83	1.17	0.06	0.513	0.60
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	641666	1	1	Speed	Ant 2	w/	-	1.00	18.50	17.89	1.15	0.07	0.529	0.61
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	643332	1	1	Speed	Ant 2	w/	-	1.00	18.50	17.84	1.16	0.09	0.517	0.60
	5GNR-n78	DFT-s QPSK100M	Bottom of Laptop	0	650000	1	1	WNC	Ant 2	w/	-	1.00	18.50	17.99	1.12	-0.02	0.556	0.62

Body SAR Test Result

System & Position								DUT Configuration			SAR							
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB#	RB offset	Antenna Manufacturer	Ant Status	Power Reduction	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
27	WLAN2.4G	802.11b	Bottom of Laptop	0	6			Speed	Ant 0	w/o	97.00	1.03	15.50	15.48	1.00	-0.01	0.708	0.73
	WLAN2.4G	802.11b	Bottom of Laptop	0	6			Speed	Ant 1	w/o	97.00	1.03	15.50	15.49	1.00	0.15	0.447	0.46
	WLAN2.4G	802.11n HT40	Bottom of Laptop	0	3			Speed	Ant 0+1	w/o	98.20	1.02	18.50	18.49	1.00	-0.06	0.611	0.62
	WLAN2.4G	802.11b	Bottom of Laptop	0	1			Speed	Ant 0	w/o	97.00	1.03	15.50	15.46	1.01	0.03	0.687	0.71
	WLAN2.4G	802.11b	Bottom of Laptop	0	11			Speed	Ant 0	w/o	97.00	1.03	15.50	15.43	1.02	0.04	0.656	0.69
	WLAN2.4G	802.11b	Bottom of Laptop	0	12			Speed	Ant 0	w/o	97.00	1.03	15.50	15.41	1.02	0.12	0.678	0.71
	WLAN2.4G	802.11b	Bottom of Laptop	0	13			Speed	Ant 0	w/o	97.00	1.03	15.50	15.38	1.03	-0.01	0.683	0.72
	WLAN2.4G	802.11b	Bottom of Laptop	0	6			WNC	Ant 0	w/o	97.00	1.03	15.50	15.48	1.00	0.16	0.671	0.69
	WLAN5.3G	802.11ac VHT160	Bottom of Laptop	0	50			Speed	Ant 0	w/o	95.30	1.05	12.50	12.45	1.01	0.14	0.665	0.71
28	WLAN5.3G	802.11ac VHT160	Bottom of Laptop	0	50			Speed	Ant 1	w/o	94.80	1.05	12.50	12.49	1.00	-0.13	0.699	0.73
	WLAN5.3G	802.11ac VHT160	Bottom of Laptop	0	50			Speed	Ant 0+1	w/o	90.20	1.11	15.50	15.47	1.01	0.09	0.655	0.73
	WLAN5.3G	802.11ac VHT160	Bottom of Laptop	0	50			WNC	Ant 1	w/o	94.80	1.05	12.50	12.49	1.00	0.14	0.665	0.70
	WLAN5.6G	802.11ac VHT160	Bottom of Laptop	0	114			Speed	Ant 0	w/o	95.30	1.05	12.50	12.43	1.02	0.06	0.466	0.50
29	WLAN5.6G	802.11ac VHT160	Bottom of Laptop	0	114			Speed	Ant 1	w/o	94.80	1.05	12.50	12.46	1.01	0.05	0.721	0.76
	WLAN5.6G	802.11ac VHT160	Bottom of Laptop	0	114			Speed	Ant 0+1	w/o	90.20	1.11	15.50	15.47	1.01	0.15	0.679	0.76
	WLAN5.6G	802.11ac VHT160	Bottom of Laptop	0	114			WNC	Ant 1	w/o	94.80	1.05	12.50	12.46	1.01	0.08	0.676	0.72

Body SAR Test Result

System & Position								DUT Configuration			SAR							
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	RB#	RB offset	Antenna Manufacturer	Ant Status	Power Reduction	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	WLAN5.8G	802.11ac VHT80	Bottom of Laptop	0	155			Speed	Ant 0	w/o	97.50	1.03	12.50	12.49	1.00	-0.02	0.493	0.51
30	WLAN5.8G	802.11ac VHT80	Bottom of Laptop	0	155			Speed	Ant 1	w/o	97.20	1.03	12.50	12.48	1.00	-0.04	0.554	0.57
	WLAN5.8G	802.11ac VHT80	Bottom of Laptop	0	155			Speed	Ant 0+1	w/o	94.60	1.06	15.50	15.50	1.00	-0.06	0.539	0.57
	WLAN5.8G	802.11ac VHT80	Bottom of Laptop	0	155			WNC	Ant 1	w/o	97.20	1.03	12.50	12.48	1.00	-0.03	0.508	0.52
31	WLAN5.9G	802.11ac VHT160	Bottom of Laptop	0	163			Speed	Ant 0	w/o	95.30	1.05	12.50	12.48	1.00	-0.02	0.748	0.79
	WLAN5.9G	802.11ac VHT160	Bottom of Laptop	0	163			Speed	Ant 1	w/o	94.80	1.05	12.50	12.48	1.00	-0.13	0.657	0.69
	WLAN5.9G	802.11ac VHT160	Bottom of Laptop	0	163			Speed	Ant 0+1	w/o	90.20	1.11	15.50	15.47	1.01	0.08	0.694	0.78
	WLAN5.9G	802.11ac VHT160	Bottom of Laptop	0	163			WNC	Ant 0	w/o	95.30	1.05	12.50	12.48	1.00	-0.04	0.703	0.74
	BT	BR / EDR	Bottom of Laptop	0	39			Speed	Ant 1	w/o	76.35	1.31	11.00	10.96	1.01	0.07	0.039	0.05
	BT	BR / EDR	Bottom of Laptop	0	0			Speed	Ant 1	w/o	76.35	1.31	11.00	10.81	1.04	-0.14	0.051	0.07
32	BT	BR / EDR	Bottom of Laptop	0	78			Speed	Ant 1	w/o	76.35	1.31	11.00	10.86	1.03	-0.05	0.054	0.07
	BT	BR / EDR	Bottom of Laptop	0	78			WNC	Ant 1	w/o	76.35	1.31	11.00	10.86	1.03	0.01	0.045	0.06
34	RFID	ASK	Bottom of Laptop	0	13.56			Speed	-	-	-	1.00	-	-	1.00	0	<0.001	0.00
	RFID	ASK	Bottom of Laptop	0	13.56			HB	-	-	-	1.00	-	-	1.00	0	<0.001	0.00

SAR and Power Density Test Result

System & Position						DUT Configuration			SAR										Power Density								
Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Channel	Antenna Manufacturer	Ant Status	Power Status	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)	Measured APD W/m^2 (4cm^2)	Scaled APD W/m^2 (4cm^2)	Grid Step [λ]	iPD [W/m2]	Scaling Factor for Measurement Uncertainty	Averaging Area [cm2]	Power Drift [dB]	Normal psPD [W/m2]	Scaled Normal psPD [W/m2]	Total psPD [W/m2]	Scaled Total psPD [W/m2]
	UNII-7	802.11be HE320	Bottom of Laptop	0	127	Speed	Ant 0	Full	93.70	1.07	10.00	9.86	1.06	0.16	0.218	0.25	1.31	1.49									
	UNII-5	802.11be HE320	Bottom of Laptop	0	31	Speed	Ant 1	Full	93.90	1.06	10.00	9.98	1.00	-0.19	0.296	0.31	1.78	1.89									
	UNII-5	802.11be HE320	Bottom of Laptop	0	31	Speed	Ant 0+1	Full	88.70	1.13	13.00	12.93	1.02	0.03	0.261	0.30	1.57	1.81									
	UNII-7	802.11be HE320	Bottom of Laptop	0	127	Speed	Ant 0	LPI	93.70	1.07	10.00	9.86	1.06	0.06	0.191	0.22	1.29	1.46									
	UNII-5	802.11be HE320	Bottom of Laptop	0	31	Speed	Ant 1	LPI	93.90	1.06	10.00	9.98	1.00	-0.12	0.276	0.29	1.71	1.81									
	UNII-5	802.11be HE320	Bottom of Laptop	0	31	Speed	Ant 0+1	LPI	88.70	1.13	13.00	12.93	1.02	0.17	0.243	0.28	1.45	1.67									
	UNII-5	802.11be HE320	Bottom of Laptop	0	63	Speed	Ant 1	Full	93.90	1.06	10.00	9.92	1.02	-0.12	0.283	0.31	2.09	2.26									
	UNII-5	802.11be HE320	Bottom of Laptop	0	95	Speed	Ant 1	Full	93.90	1.06	10.00	9.96	1.01	-0.06	0.351	0.38	2.24	2.4	0.0535	24.38	1.545	4.00	0.02	1.52	2.49	2.81	4.65
	UNII-6	802.11ax HE160	Bottom of Laptop	0	111	Speed	Ant 1	Full	93.90	1.06	10.00	9.95	1.04	0.02	0.347	0.38	2.21	2.44	0.0542	24.05	1.545	4.00	0.03	1.5	2.46	2.77	4.72
	UNII-7	802.11be HE320	Bottom of Laptop	0	127	Speed	Ant 1	Full	93.90	1.06	10.00	9.98	1.00	0.04	0.301	0.32	2.03	2.15	0.0549	22.09	1.545	4.00	-0.11	1.37	2.24	2.55	4.18
	UNII-7	802.11be HE320	Bottom of Laptop	0	159	Speed	Ant 1	Full	93.90	1.06	10.00	9.92	1.02	0.05	0.353	0.38	2.25	2.43	0.0562	24.49	1.545	4.00	-0.09	1.52	2.49	2.82	4.71
33	UNII-8	802.11be HE320	Bottom of Laptop	0	191	Speed	Ant 1	Full	93.90	1.06	10.00	9.98	1.00	0.06	0.372	0.39	2.34	2.48	0.0575	25.47	1.545	4.00	0.09	1.59	2.6	2.94	4.81
	UNII-8	802.11be HE320	Bottom of Laptop	0	191	WNC	Ant 1	Full	93.90	1.06	10.00	9.98	1.00	-0.08	0.356	0.38	2.31	2.45									

Appendix H. Analysis of Simultaneous Transmission.

The analysis of simultaneous transmission SAR are shown as below.

<Possibilities of Simultaneous Transmission>

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous TX Combination	Capable Transmit Configurations	Body Exposure Condition
A	WWAN + WLAN 2.4G + BT + RFID	Yes
B	WWAN + WLAN 5G + BT + RFID	Yes
C	WWAN + WLAN 6G + BT + RFID	Yes

Notes

1. The WLAN 2.4G, 5G and 6G cannot transmit simultaneously.
2. The transmitter of WWAN Ant 1 is more than 20 cm from Bottom of Laptop, there is no requirement for that posotion to evaluate simultaneous transmission.

Simultaneous Transmission SAR Evaluation										
Band	Position	1	2	3	4	5	6	A(1+2+5+6)	B(1+3+5+6)	C(1+4+5+6)
		Max WWAN	Max WLAN 2.4GHz	Max WLAN 5GHz	Max WLAN 6GHz	Max BT	Max RFID	Summimg result 1g SAR W/kg	Summimg result 1g SAR W/kg	Summimg result 1g SAR W/kg
		1g SAR W/kg	1g SAR W/kg	1g SAR W/kg	1g SAR W/kg	1g SAR W/kg	1g SAR W/kg			
LTE 41	Bottom of Laptop	0.57	0.73	0.79	0.39	0.07	0.00	1.37	1.43	1.03
LTE 42	Bottom of Laptop	0.53	0.73	0.79	0.39	0.07	0.00	1.33	1.39	0.99
LTE 43	Bottom of Laptop	0.35	0.73	0.79	0.39	0.07	0.00	1.15	1.21	0.81
LTE 48	Bottom of Laptop	0.52	0.73	0.79	0.39	0.07	0.00	1.32	1.38	0.98
5GNR-n41	Bottom of Laptop	0.45	0.73	0.79	0.39	0.07	0.00	1.25	1.31	0.91
5GNR-n48	Bottom of Laptop	0.66	0.73	0.79	0.39	0.07	0.00	1.46	1.52	1.12
5GNR-n77	Bottom of Laptop	0.63	0.73	0.79	0.39	0.07	0.00	1.43	1.49	1.09
5GNR-n78	Bottom of Laptop	0.63	0.73	0.79	0.39	0.07	0.00	1.43	1.49	1.09

Total Exposure Ratio						
Band	Position	1	4	5	6	C(1+4+5+6)
		Max WWAN	Max WLAN 6GHz	Max BT	Max RFID	Total Exposure Ratio
		1g SAR W/kg	4cm2 W/m2	1g SAR W/kg	1g SAR W/kg	
LTE 41	Bottom of Laptop	0.57	4.81	0.07	0.00	0.88
LTE 42	Bottom of Laptop	0.53	4.81	0.07	0.00	0.86
LTE 43	Bottom of Laptop	0.35	4.81	0.07	0.00	0.74
LTE 48	Bottom of Laptop	0.52	4.81	0.07	0.00	0.85
5GNR-n41	Bottom of Laptop	0.45	4.81	0.07	0.00	0.81
5GNR-n48	Bottom of Laptop	0.66	4.81	0.07	0.00	0.94
5GNR-n77	Bottom of Laptop	0.63	4.81	0.07	0.00	0.92
5GNR-n78	Bottom of Laptop	0.63	4.81	0.07	0.00	0.92

Appendix J. Calibration of Test Equipment List

Calibration of Test Equipment List are shown as below.

Equipment for SAR Test					
Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	CLA13	1018	Mar. 20, 2023	1 Year
System Validation Dipole	SPEAG	D2450V2	737	Feb. 20, 2023	1 Year
System Validation Dipole	SPEAG	D2600V2	1020	Aug. 18, 2023	1 Year
System Validation Dipole	SPEAG	D3500V2	1007	Jan. 22, 2023	1 Year
System Validation Dipole	SPEAG	D3700V2	1017	Feb. 23, 2023	1 Year
System Validation Dipole	SPEAG	D3900V2	1020	Feb. 23, 2023	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Feb. 22, 2023	1 Year
System Validation Dipole	SPEAG	D6.5GHzV2	1008	Sep. 21, 2023	1 Year
System Verification Source	SPEAG	5G Verification Source 10 GHz	1025	Jan. 19, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Jan. 20, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7555	Jul. 19, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7720	Mar. 23, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7778	Nov. 22, 2023	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7797	Jan. 08, 2024	1 Year
E-Field Probe	SPEAG	EUmmWV4	9615	Jul. 10, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1585	Jul. 14, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1698	Nov. 17, 2023	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1589	May. 24, 2023	1 Year
Universal Radio Communication Tester	Anritsu	MT8821C	6201381727	Aug. 09, 2023	1 Year
Universal Radio Communication Tester	Anritsu	MT8000A	6272278610	Aug. 16, 2023	1 Year
Universal Radio Communication Tester	R&S	CMW500	164864	Jul. 13, 2023	1 Year
Analong Signal Generator	R&S	SMA100B	104417	Oct. 23, 2023	1 Year
Mini-Circuits Wideband Amplifier	Mini-Circuits	ZVA-183-S+	434502031A	Jul. 07, 2023	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 03, 2023	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 03, 2023	1 Year
Thermometer	YFE	YF-160A	120702365	Sep. 11, 2023	1 Year
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1092	May. 23, 2023	1 Year
Dielectric Assessment Kit	SPEAG	DAKS_VNA R140	0010917	May. 22, 2023	1 Year
Powersource1	SPEAG	SE_UMS_160 BA	1052	Jul. 13, 2023	1 Year

Appendix Z. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.

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

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

Accredited by the Swiss Accreditation Service (SAS)
Accreditation No.: SCS 0108

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

Client B.V. ADT
Taoyuan City, Taiwan

Certificate No. CLA13-1018_Mar23

CALIBRATION CERTIFICATE

Object: CLA13 - SN: 1018

Calibration procedure(s): QA CAL-15.v10
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: March 20, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 3877	06-Jan-23 (No. EX3-3877_Jan23)	Jan-24
DAE4	SN: 654	27-Jan-23 (No. DAE4-654_Jan23)	Jan-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter NRP2	SN: 107193	08-Nov-21 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100922	15-Dec-09 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100418	01-Jan-04 (in house check Dec-22)	In house check: Dec-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: March 21, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	13 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	55.0	0.75 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	0.74 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	1 W input power	0.534 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**0.538 W/kg ± 18.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	1 W input power	0.335 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**0.337 W/kg ± 18.0 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 2.8 jΩ
Return Loss	- 29.4 dB

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 20.03.2023

Test Laboratory: SPEAG, Zurich, Switzerland

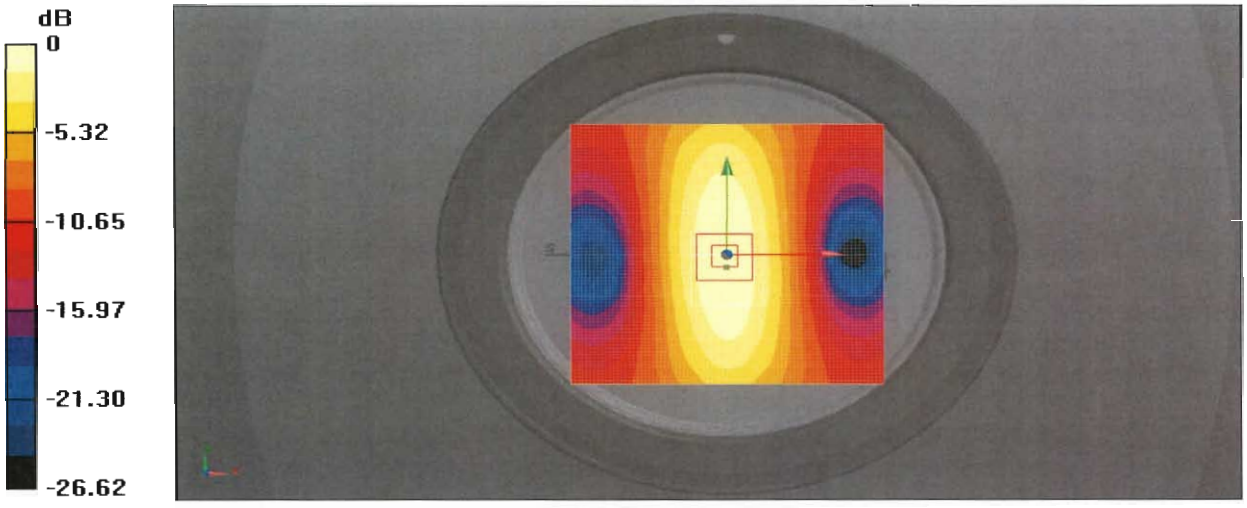
DUT: CLA13; Type: CLA13; Serial: CLA13 - SN: 1018

Communication System: UID 0 - CW; Frequency: 13 MHz
Medium parameters used: f = 13 MHz; σ = 0.74 S/m; εr = 54.1; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

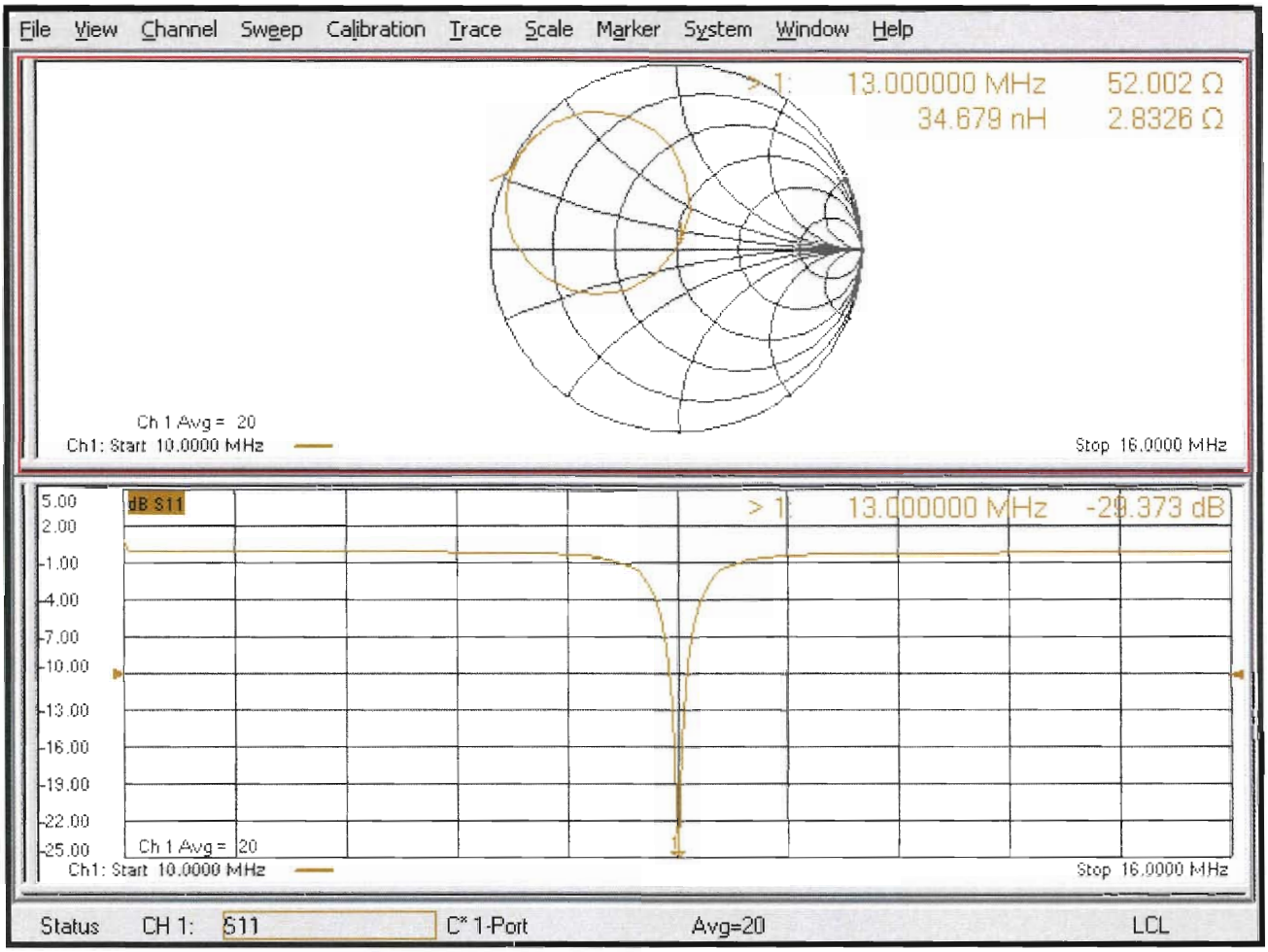
- Probe: EX3DV4 - SN3877; ConvF(15.33, 15.33, 15.33) @ 13 MHz; Calibrated: 06.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 27.01.2023
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2034
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

CLA Calibration for HSL-LF Tissue/CLA-13, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x10x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 32.07 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.534 W/kg; SAR(10 g) = 0.335 W/kg
Smallest distance from peaks to all points 3 dB below = 18.4 mm
Ratio of SAR at M2 to SAR at M1 = 79.5%
Maximum value of SAR (measured) = 0.782 W/kg



0 dB = 0.782 W/kg = -1.07 dBW/kg

Impedance Measurement Plot for Head TSL



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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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 B.V. ADT

Certificate No: D2450V2-737_Feb23

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:737
Calibration procedure(s)	QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	February 20, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 7349	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: February 20, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.3 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.8 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**50.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.7 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.8 Ω + 4.9 jΩ
Return Loss	- 23.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 20.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:737

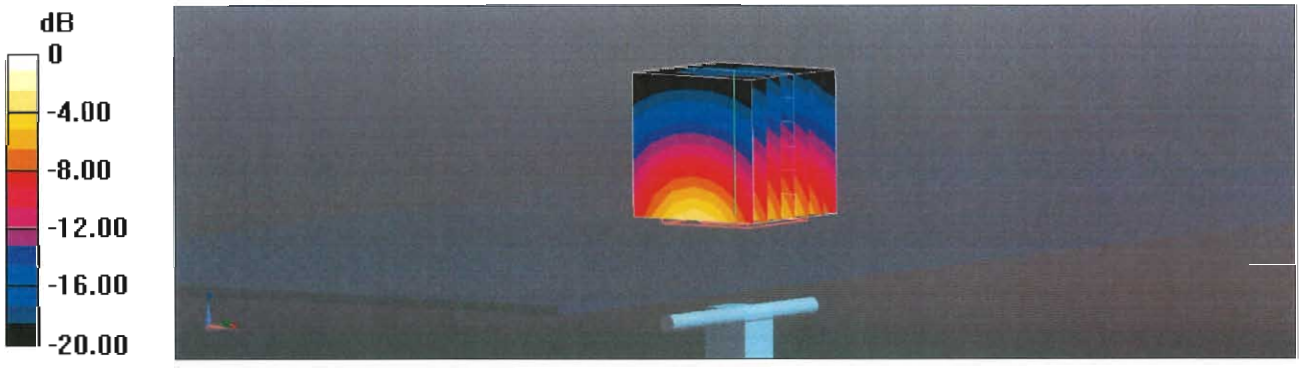
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 S/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.88, 7.88, 7.88) @ 2450 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

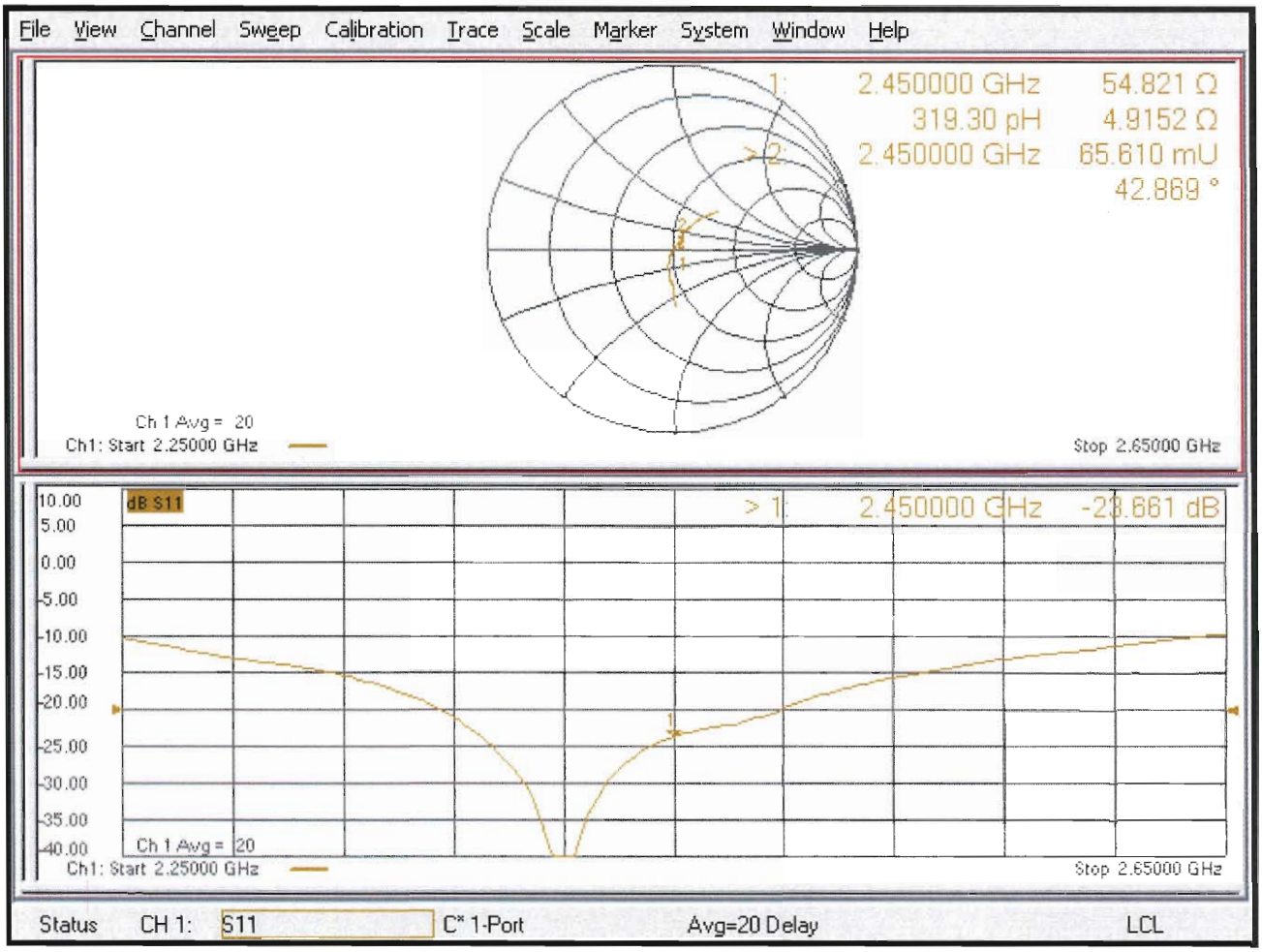
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 112.6 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 25.0 W/kg
SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.97 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 50.9%
Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

Impedance Measurement Plot for Head TSL



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

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S Servizio svizzero di taratura
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 **B.V. ADT**
Taoyuan City

Certificate No. **D2600V2-1020_Aug23**

CALIBRATION CERTIFICATE

Object: D2600V2 - SN:1020

Calibration procedure(s): QA CAL-05.v12
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: August 18, 2023

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
Power sensor NRP-Z91	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Type-N mismatch combination	SN: 310982 / 06327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX3DV4	SN: 7349	10-Jan-23 (No. EX3-7349_Jan23)	Jan-24
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: August 22, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.6 ± 6 %	1.99 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**55.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.9 Ω - 4.8 jΩ
Return Loss	- 24.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Date: 18.08.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1020

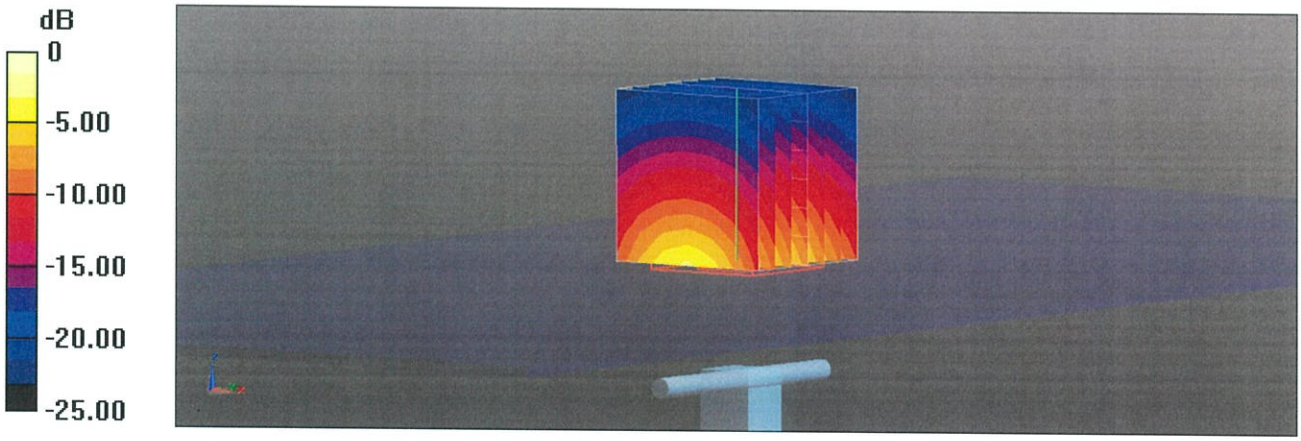
Communication System: UID 0 - CW; Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 1.99 S/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.84, 7.84, 7.84) @ 2600 MHz; Calibrated: 10.01.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

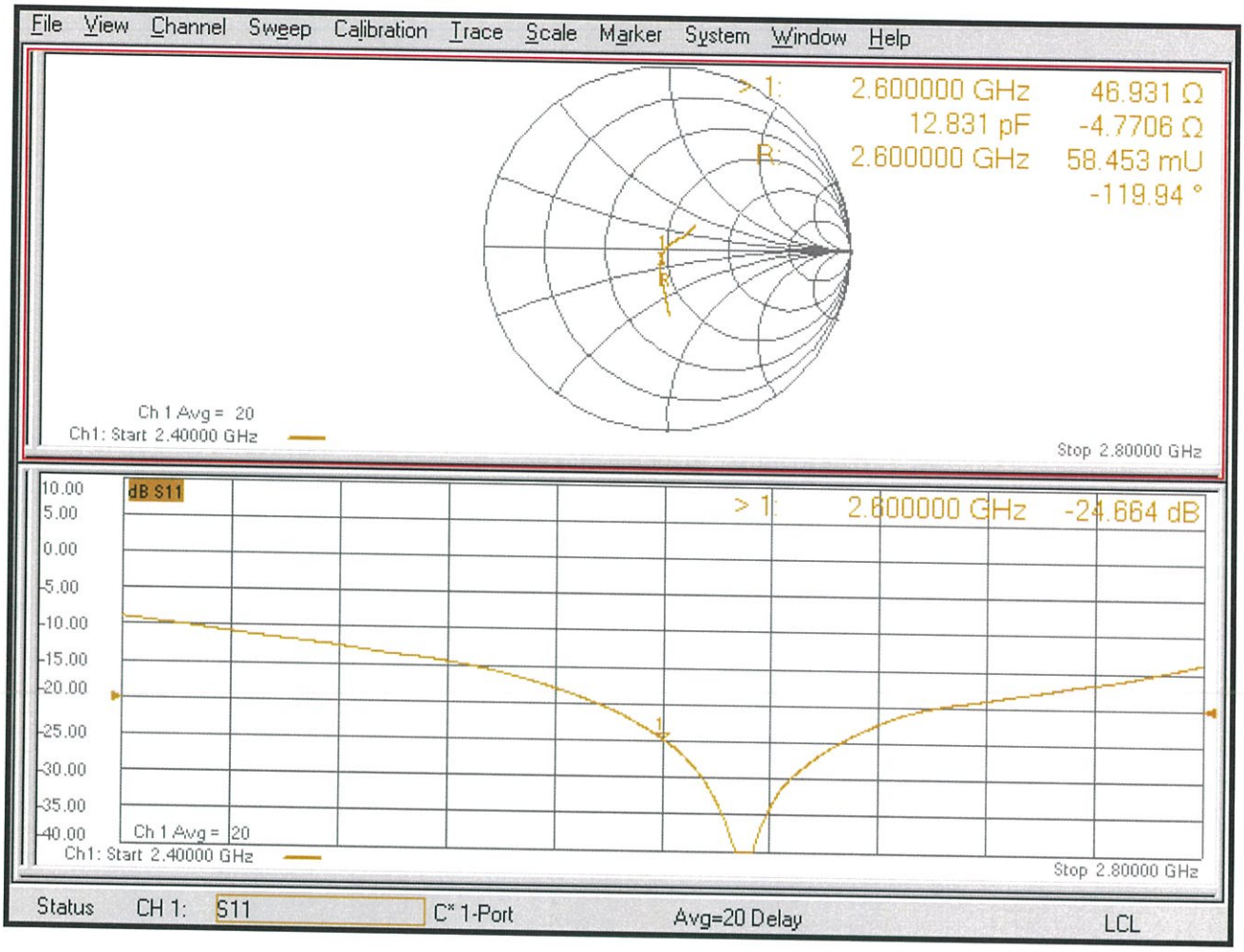
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 119.3 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.43 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 51.3%
Maximum value of SAR (measured) = 23.5 W/kg



0 dB = 23.5 W/kg = 13.71 dBW/kg

Impedance Measurement Plot for Head TSL



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Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 0108

Client B.V. ADT (Auden)

Certificate No: D3500V2-1007_Jan23

CALIBRATION CERTIFICATE

Object: D3500V2 - SN:1007

Calibration procedure(s): QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz

Calibration date: January 22, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 3503	08-Mar-22 (No. EX3-3503_Mar22)	Mar-23
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: January 23, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3500 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	37.9	2.91 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.1 ± 6 %	2.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.69 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**66.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.50 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**25.1 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.4 Ω - 3.9 jΩ
Return Loss	- 27.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.137 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 22.01.2023

Test Laboratory: SPEAG, Zurich, Switzerland

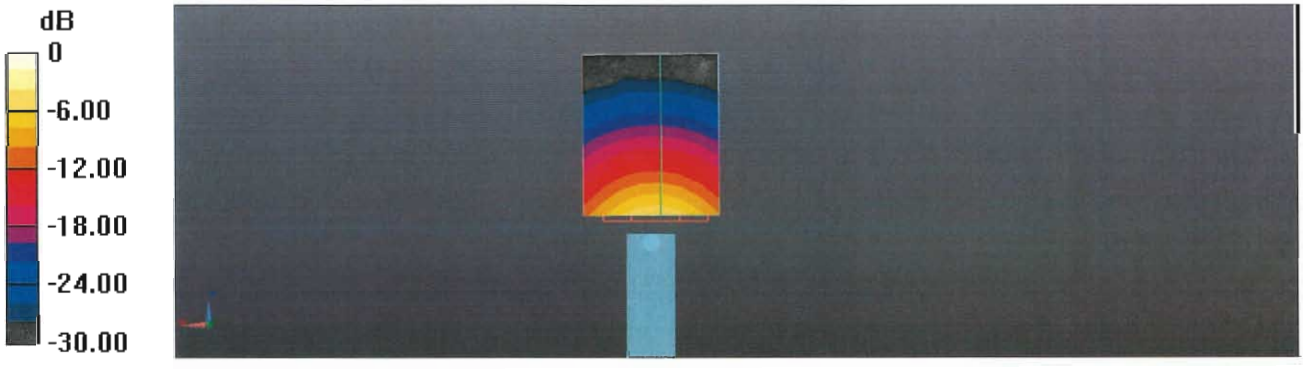
DUT: Dipole 3500 MHz; Type: D3500V2; Serial: D3500V2 - SN:1007

Communication System: UID 0 - CW; Frequency: 3500 MHz
Medium parameters used: f = 3500 MHz; σ = 2.93 S/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

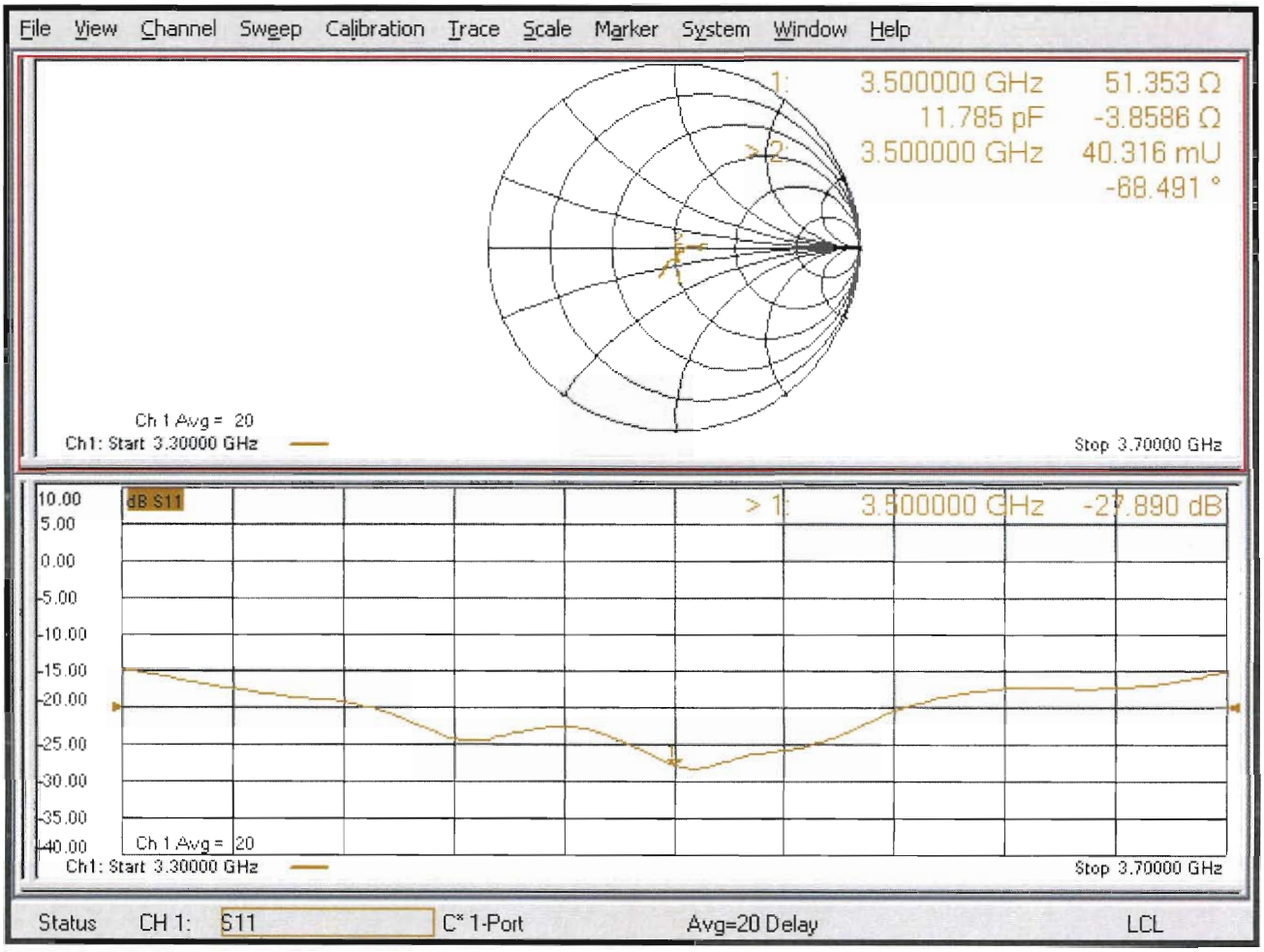
- Probe: EX3DV4 - SN3503; ConvF(7.91, 7.91, 7.91) @ 3500 MHz; Calibrated: 08.03.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3500MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.99 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 6.69 W/kg; SAR(10 g) = 2.50 W/kg
Smallest distance from peaks to all points 3 dB below = 8.2 mm
Ratio of SAR at M2 to SAR at M1 = 75.4%
Maximum value of SAR (measured) = 12.7 W/kg



0 dB = 12.7 W/kg = 11.05 dBW/kg

Impedance Measurement Plot for Head TSL



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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 B.V. ADT

Certificate No: D3700V2-1017_Feb23

CALIBRATION CERTIFICATE

Object: D3700V2 - SN:1017

Calibration procedure(s): QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz

Calibration date: February 23, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 3503	08-Mar-22 (No. EX3-3503_Mar22)	Mar-23
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: February 24, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3700 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	37.7	3.12 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	3.09 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.48 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**65.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.8 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω - 9.0 jΩ
Return Loss	- 20.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.136 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 23.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

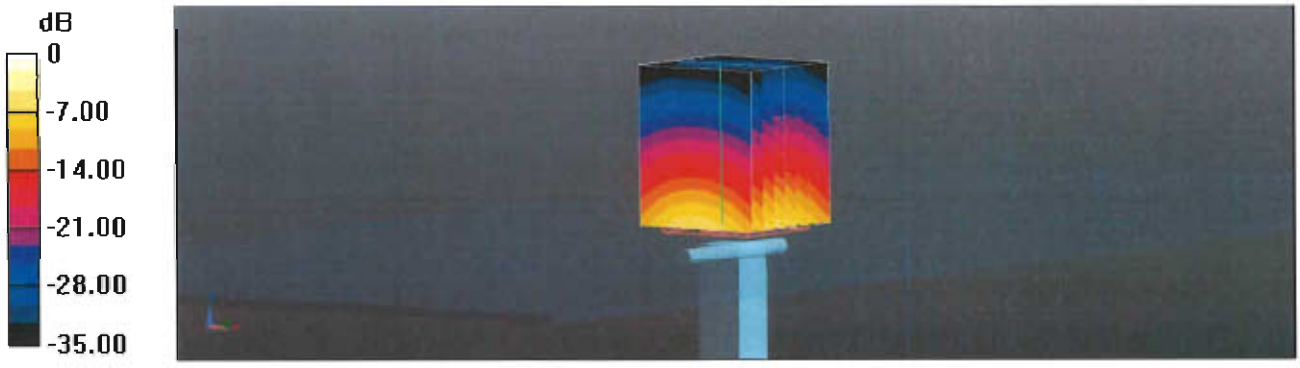
DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN:1017

Communication System: UID 0 - CW; Frequency: 3700 MHz
Medium parameters used: f = 3700 MHz; σ = 3.09 S/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

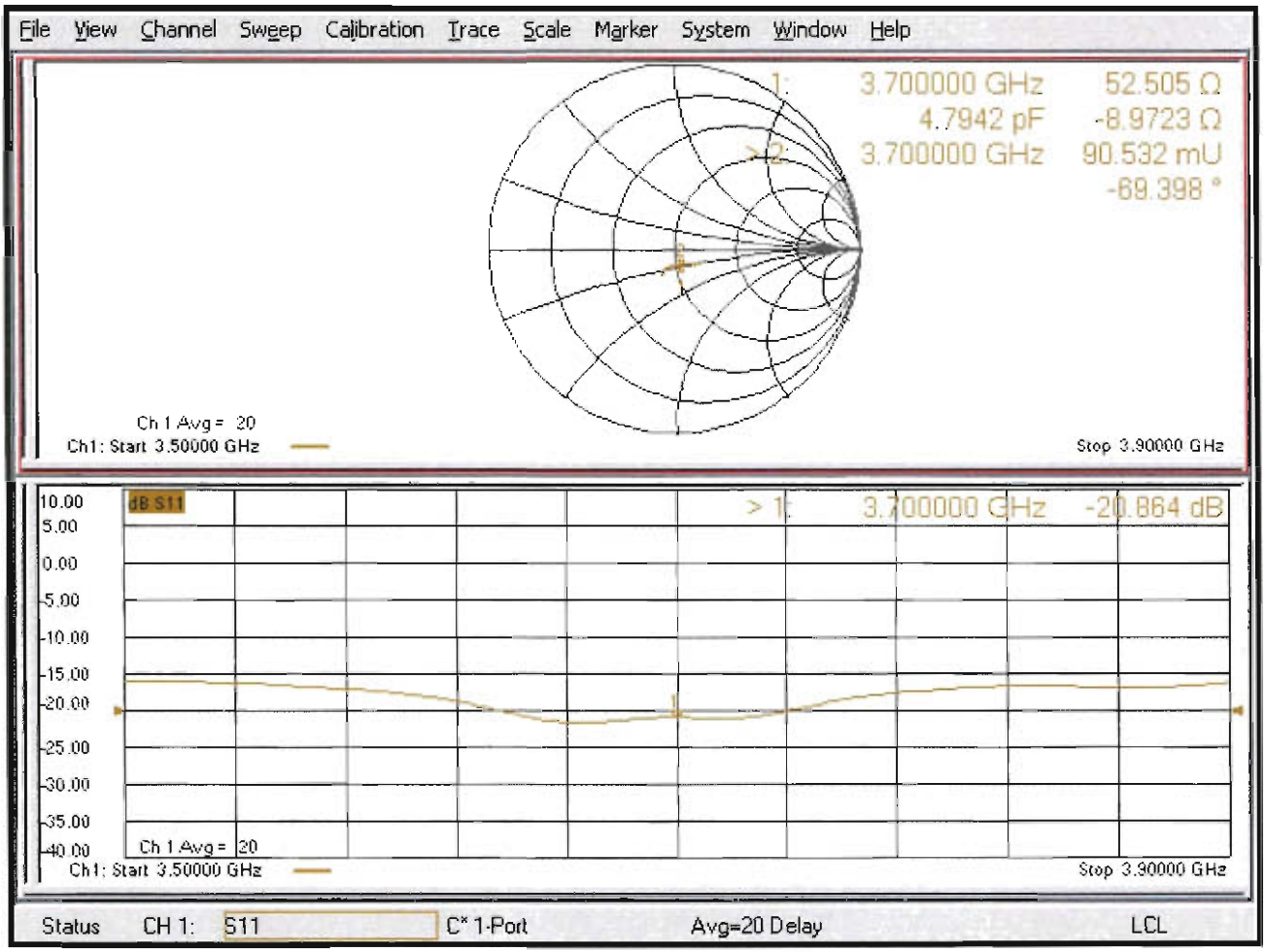
- Probe: EX3DV4 - SN3503; ConvF(7.73, 7.73, 7.73) @ 3700 MHz; Calibrated: 08.03.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3700MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.33 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 18.0 W/kg
SAR(1 g) = 6.48 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 74.3%
Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

Impedance Measurement Plot for Head TSL



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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 B.V. ADT

Certificate No: D3900V2-1020_Feb23

CALIBRATION CERTIFICATE

Object: D3900V2 - SN:1020

Calibration procedure(s): QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz

Calibration date: February 23, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 3503	08-Mar-22 (No. EX3-3503_Mar22)	Mar-23
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Meis Kuster	Quality Manager	

Issued: February 24, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3900 MHz ± 1 MHz 4100 MHz ± 1 MHz	

Head TSL parameters at 3900 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	37.5	3.32 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.0 ± 6 %	3.26 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 3900 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**70.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 4100 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	37.2	3.53 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	3.45 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 4100 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.79 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**68.4 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.6 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 3900 MHz

Impedance, transformed to feed point	47.7 Ω - 2.3 jΩ
Return Loss	- 29.5 dB

Antenna Parameters with Head TSL at 4100 MHz

Impedance, transformed to feed point	54.9 Ω - 1.3 jΩ
Return Loss	- 26.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.103 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 23.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: D3900V2 - SN:1020

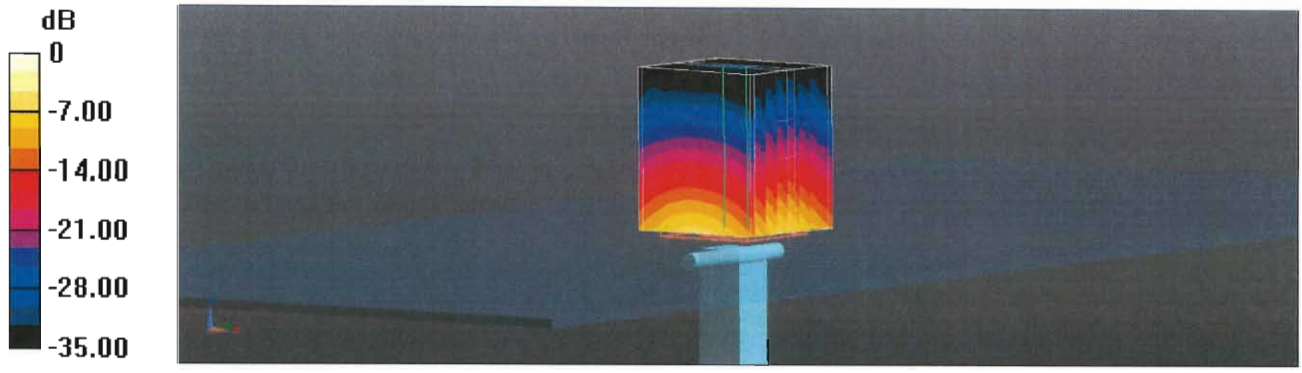
Communication System: UID 0 - CW; Frequency: 3900 MHz, Frequency: 4100 MHz
Medium parameters used: f = 3900 MHz; σ = 3.26 S/m; ε_r = 38; ρ = 1000 kg/m^3
Medium parameters used: f = 4100 MHz; σ = 3.45 S/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.39, 7.39, 7.39) @ 3900 MHz, ConvF(7.26, 7.26, 7.26) @ 4100 MHz; Calibrated: 08.03.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

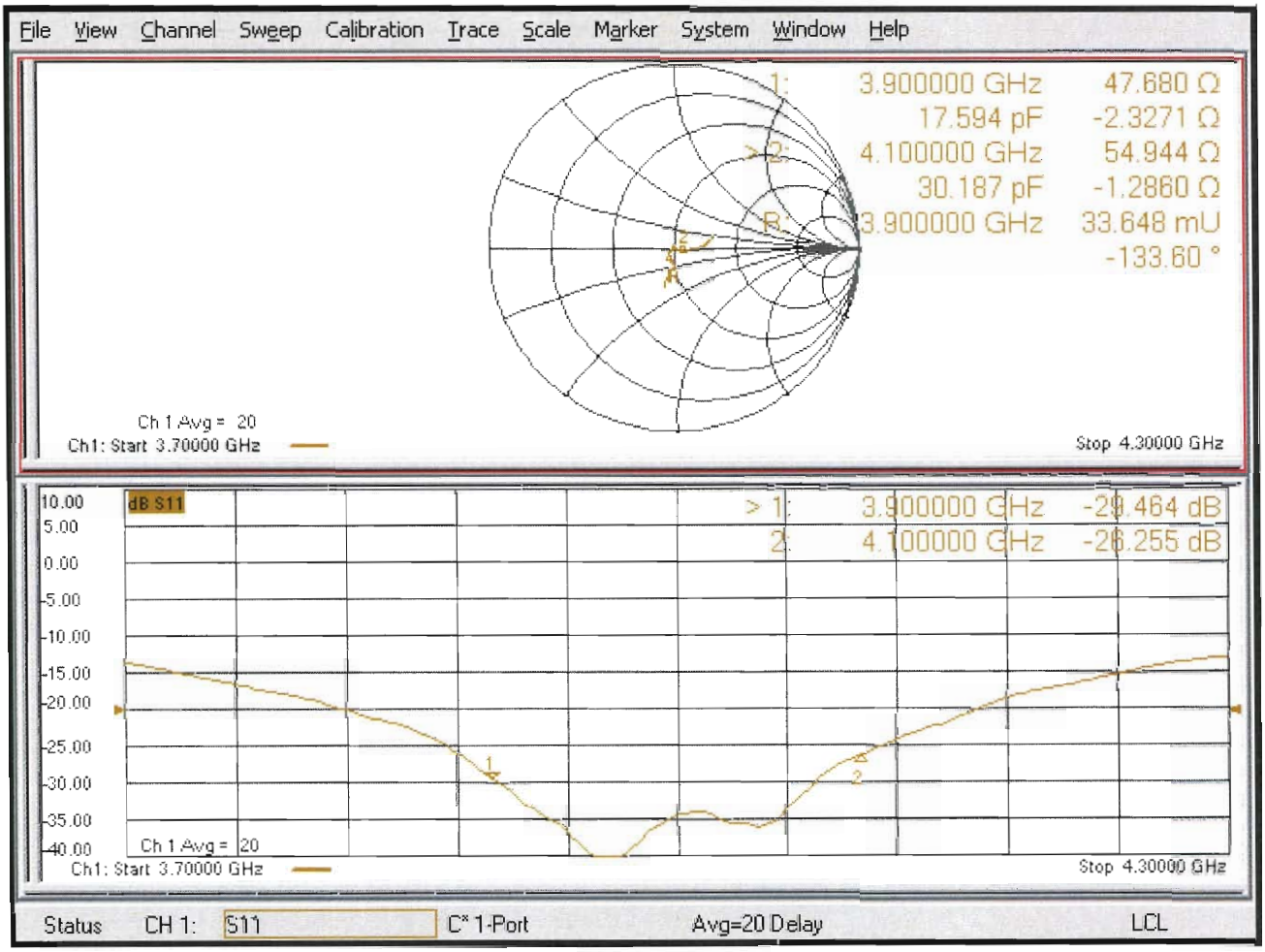
Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3900MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.22 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 19.9 W/kg
SAR(1 g) = 7.01 W/kg; SAR(10 g) = 2.44 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 73.7%
Maximum value of SAR (measured) = 13.7 W/kg

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=4100MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.05 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 6.79 W/kg; SAR(10 g) = 2.35 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 74.7%
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.35 dBW/kg

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 0108

Client B.V. ADT

Certificate No: D5GHzV2-1019_Feb23

CALIBRATION CERTIFICATE

Object: D5GHzV2 - SN:1019

Calibration procedure(s): QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz

Calibration date: February 22, 2023

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 3503	08-Mar-22 (No. EX3-3503_Mar22)	Mar-23
DAE4	SN: 601	19-Dec-22 (No. DAE4-601_Dec22)	Dec-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by:	Paulo Pina	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: February 23, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.0 ± 6 %	4.67 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.9 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.9 ± 6 %	5.06 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**83.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.7 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.6 ± 6 %	5.21 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.2 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.25 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.5 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	52.6 Ω - 3.4 jΩ
Return Loss	- 27.5 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	57.8 Ω + 0.1 jΩ
Return Loss	- 22.9 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	55.2 Ω + 4.7 jΩ
Return Loss	- 23.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.203 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 22.02.2023

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1019

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5250 MHz; σ = 4.67 S/m; ε_r = 36; ρ = 1000 kg/m^3
Medium parameters used: f = 5600 MHz; σ = 5.06 S/m; ε_r = 35.9; ρ = 1000 kg/m^3
Medium parameters used: f = 5800 MHz; σ = 5.21 S/m; ε_r = 35.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

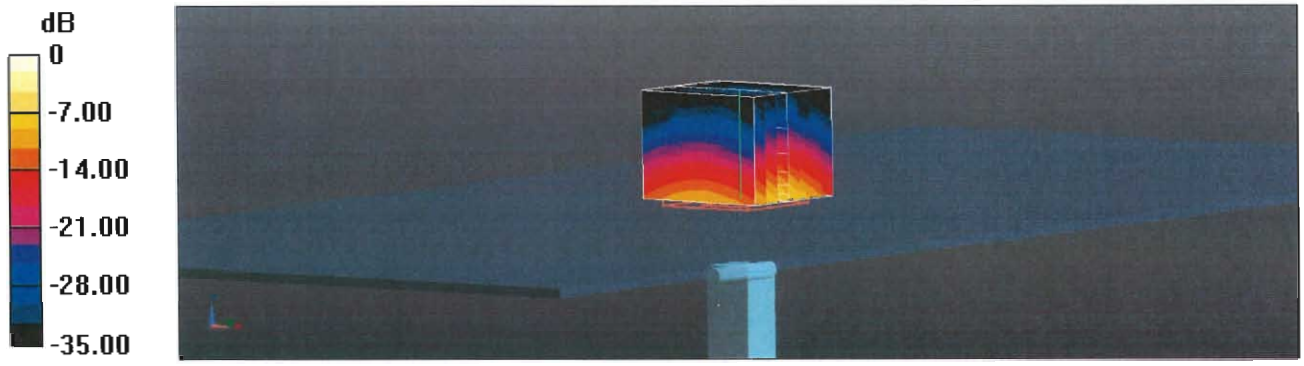
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.5, 5.5, 5.5) @ 5250 MHz, ConvF(5.1, 5.1, 5.1) @ 5600 MHz, ConvF(5.01, 5.01, 5.01) @ 5800 MHz; Calibrated: 08.03.2022
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 75.93 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 27.2 W/kg
SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.29 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 71%
Maximum value of SAR (measured) = 17.9 W/kg

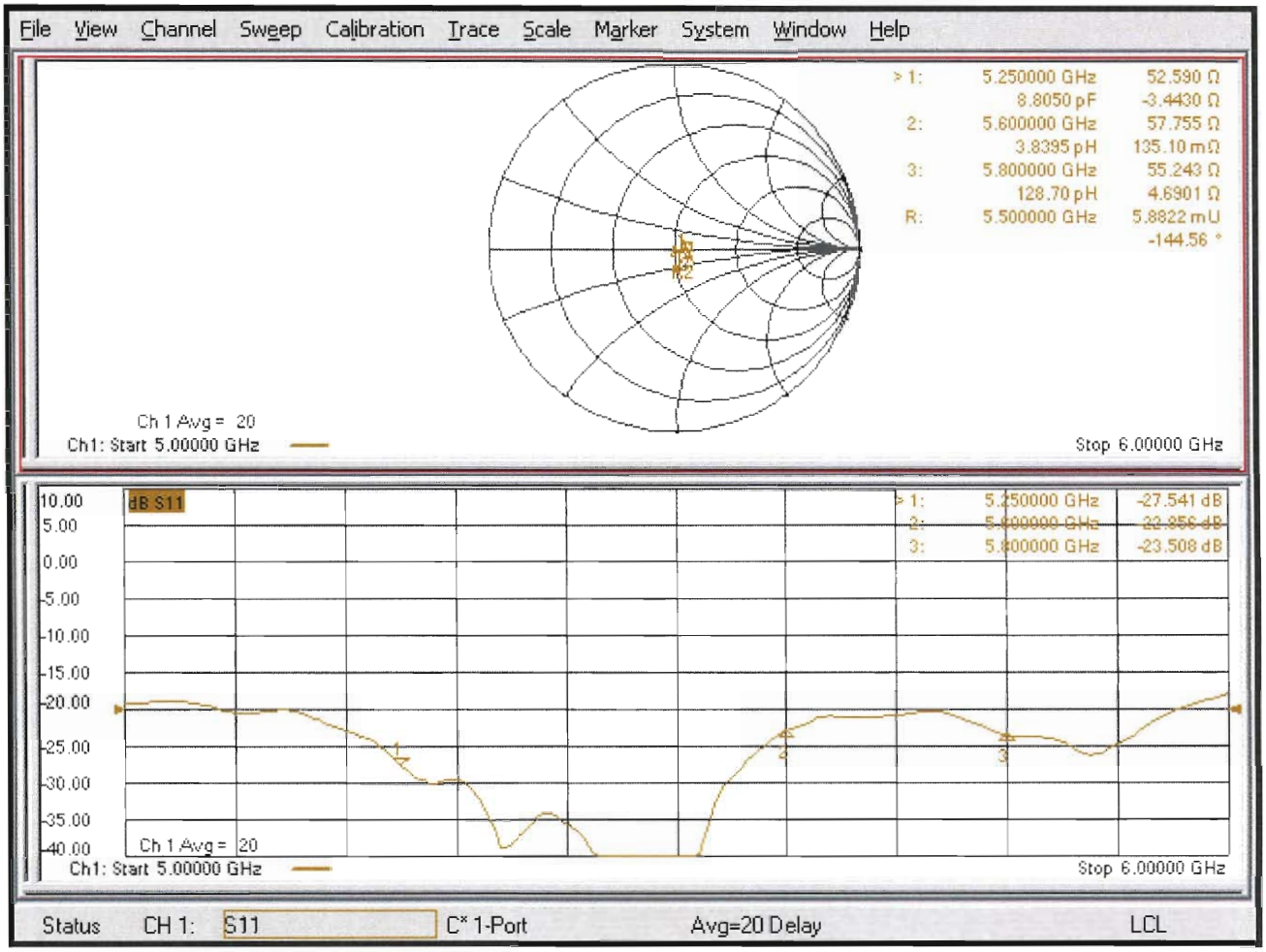
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 75.03 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 30.3 W/kg
SAR(1 g) = 8.28 W/kg; SAR(10 g) = 2.36 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 68.4%
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 73.20 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.25 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 66.3%
Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 19.1 W/kg = 12.81 dBW/kg

Impedance Measurement Plot for Head TSL



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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 B.V. ADT
Taoyuan City

Certificate No. D6.5GHzV2-1008_Sep23

CALIBRATION CERTIFICATE

Object: D6.5GHzV2 - SN:1008

Calibration procedure(s): QA CAL-22.v7
Calibration Procedure for SAR Validation Sources between 3-10 GHz

Calibration date: September 21, 2023

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 sensor R&S NRP33T	SN: 100967	03-Apr-23 (No. 217-03806)	Apr-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Mismatch combination	SN: 84224 / 360D	03-Apr-23 (No. 217-03812)	Apr-24
Reference Probe EX3DV4	SN: 7405	12-Jun-23 (No. EX3-7405_Jun23)	Jun-24
DAE4	SN: 908	03-Jul-23 (No. DAE4-908_Jul23)	Jul-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSIN20G	SN: 827	18-Dec-18 (in house check Dec-21)	In house check: Dec-23
Power sensor NRP-Z23	SN: 100169	10-Jan-19 (in house check Nov-22)	In house check: Nov-23
Power sensor NRP-18T	SN: 100950	28-Sep-22 (in house check Nov-22)	In house check: Nov-23
Network Analyzer Keysight E5063A	SN:MY54504221	31-Oct-19 (in house check Oct-22)	In house check: Oct-25

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: September 21, 2023

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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.

Additional Documentation:

b) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.
- *The absorbed power density (APD):* The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "*Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems*", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY6	V16.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	6500 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.3 ± 6 %	6.09 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	-----	-----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	29.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**292 W/kg ± 24.7 % (k=2)**

SAR averaged over 8 cm^3 (8 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.65 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**65.9 W/kg ± 24.4 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	5.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**53.9 W/kg ± 24.4 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.2 Ω - 6.9 jΩ
Return Loss	- 23.0 dB

APD (Absorbed Power Density)

APD averaged over 1 cm²	Condition	
APD measured	100 mW input power	291 W/m²
APD measured	normalized to 1W	**2910 W/m² ± 29.2 % (k=2)**

APD averaged over 4 cm²	condition	
APD measured	100 mW input power	133 W/m²
APD measured	normalized to 1W	**1330 W/m² ± 28.9 % (k=2)**

*The reported APD values have been derived using the psSAR1g and psSAR8g.

General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY6 Validation Report for Head TSL

Measurement Report for D6.5GHz-1008, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
D6.5GHz	10.0 x 10.0 x 10.0	SN: 1008	-

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz]	Conversion Factor	TSL Cond. [S/m]	TSL Permittivity
Flat, HSL	5.00	Band	CW,	6500	5.50	6.09	33.3

Hardware Setup

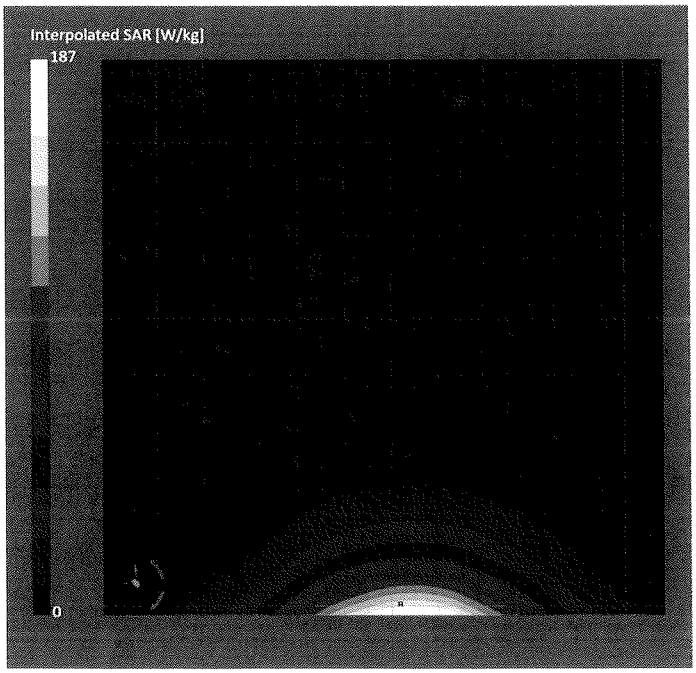
Phantom	TSL	Probe, Calibration Date	DAE, Calibration Date
MFP V8.0 Center - 1182	HBBL600-10000V6	EX3DV4 - SN7405, 2023-06-12	DAE4 Sn908, 2023-07-03

Scan Setup

	Zoom Scan
Grid Extents [mm]	22.0 x 22.0 x 22.0
Grid Steps [mm]	3.4 x 3.4 x 1.4
Sensor Surface [mm]	1.4
Graded Grid	Yes
Grading Ratio	1.4
MAIA	N/A
Surface Detection	VMS + 6p
Scan Method	Measured

Measurement Results

	Zoom Scan
Date	2023-09-21, 12:35
psSAR1g [W/Kg]	29.4
psSAR8g [W/Kg]	6.65
psSAR10g [W/Kg]	5.44
Power Drift [dB]	0.02
Power Scaling	Disabled
Scaling Factor [dB]	
TSL Correction	No correction
M2/M1 [%]	50.7
Dist 3dB Peak [mm]	4.6



Impedance Measurement Plot for Head TSL