Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	153.2	± 3.5 %
		Y	0.00	0.00	1.00		144.5	
		Z	0.00	0.00	1.00		151.4	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	2.46	65.57	10.33	10.00	20.0	± 9.6 %
		Y	2.58	66.85	10.94		20.0	
		Z	1.86	62.99	8.17		20.0	
10011-CAB	UMTS-FDD (WCDMA)	X	0.96	69.29	15.51	0.00	150.0	± 9.6 %
		Y	0.93	66.88	14.68		150.0	
		Z	0.96	69.60	15.68		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.07	64.52	15.65	0.41	150.0	± 9.6 %
		Y	1.12	63.74	15.00		150.0	
		Z	1.05	64.42	15.37		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	4.64	67.04	17.28	1.46	150.0	± 9.6 %
		Y	4.69	66.78	16.99		150.0	
		Z	4.48	67.08	16.97		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	100.00	113.55	27.40	9.39	50.0	± 9.6 %
		Y	100.00	113.18	27.01		50.0	
		Z	100.00	106.64	23.61		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	100.00	113.06	27.24	9.57	50.0	± 9.6 %
		Y	100.00	112.70	26.84		50.0	
		Z	32.97	94.20	20.54		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	111.50	25.18	6.56	60.0	± 9.6 %
		Y	100.00	111.79	25.25		60.0	
		Z	100.00	104.88	21.52		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	3.89	66.96	23.84	12.57	50.0	± 9.6 %
		Y	4.25	70.19	25.75		50.0	
		Z	3.28	63.68	21.63		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	8.05	89.16	31.60	9.56	60.0	± 9.6 %
		Y	7.77	88.25	31.17		60.0	
		Z	5.87	82.94	28.96		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	110.68	23.90	4.80	80.0	± 9.6 %
		Y	100.00	112.16	24.62		80.0	
		Z	100.00	104.54	20.49		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	109.55	22.62	3.55	100.0	± 9.6 %
		Y	100.00	113.50	24.48		100.0	
		Z	100.00	104.05	19.54		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	5.29	80.16	27.01	7.80	80.0	± 9.6 %
		Y	5.14	79.09	26.35		80.0	
		Z	3.96	74.93	24.59		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	108.68	23.35	5.30	70.0	± 9.6 %
		Y	100.00	109.67	23.80		70.0	
		Z	100.00	101.79	19.60		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	0.42	62.17	5.93	1.88	100.0	± 9.6 %
		Y	100.00	107.91	20.81		100.0	
		Z	0.20	60.00	3.98		100.0	

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	0.21	60.00	3.06	1.17	100.0	± 9.6 %
		Y	100.00	108.51	20.18		100.0	
		Z	17.50	60.55	1.43		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	26.75	102.90	26.12	5.30	70.0	± 9.6 %
		Y	11.41	91.98	23.49		70.0	
		Z	8.40	86.52	20.27		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	3.04	75.65	15.32	1.88	100.0	± 9.6 %
		Y	2.84	75.48	16.17		100.0	
		Z	1.44	68.36	11.69		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	1.53	69.13	12.32	1.17	100.0	± 9.6 %
		Y	1.81	71.22	14.21		100.0	
		Z	0.97	65.45	10.03		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	68.65	116.35	29.55	5.30	70.0	± 9.6 %
		Y	17.31	98.26	25.40		70.0	
		Z	14.64	93.89	22.52		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	2.53	73.73	14.61	1.88	100.0	± 9.6 %
		Y	2.51	74.11	15.65		100.0	
		Z	1.27	67.18	11.19		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	1.60	69.92	12.78	1.17	100.0	± 9.6 %
		Y	1.84	71.62	14.51		100.0	
		Z	0.99	65.91	10.38		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	0.74	63.41	8.92	0.00	150.0	± 9.6 %
		Y	1.23	68.14	12.51		150.0	
		Z	0.60	62.45	7.98		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	108.18	24.00	7.78	50.0	± 9.6 %
		Y	100.00	108.88	24.22		50.0	
		Z	10.97	81.94	15.63		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	65.90	22.17	0.00	150.0	± 9.6 %
		Y	0.01	122.92	0.71		150.0	
		Z	0.13	128.48	4.69		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	14.87	85.35	21.09	13.80	25.0	± 9.6 %
		Y	23.17	91.69	22.64		25.0	
		Z	6.22	71.44	14.68		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	24.31	94.02	22.62	10.79	40.0	± 9.6 %
		Y	43.77	101.49	24.30		40.0	
		Z	6.49	74.97	14.88		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	18.56	94.19	24.49	9.03	50.0	± 9.6 %
		Y	19.55	95.88	25.17		50.0	
		Z	13.54	87.88	21.18		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.17	75.85	24.49	6.55	100.0	± 9.6 %
		Y	4.09	74.81	23.76		100.0	
		Z	3.25	71.57	22.39		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.13	66.04	16.48	0.61	110.0	± 9.6 %
		Y	1.16	64.80	15.58		110.0	
		Z	1.07	65.37	15.92		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	137.72	34.95	1.30	110.0	± 9.6 %
		Y	14.15	108.54	28.54		110.0	
		Z	100.00	142.16	36.45		110.0	

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	5.68	93.99	26.90	2.04	110.0	± 9.6 %
		Y	2.72	79.85	21.80		110.0	
		Z	2.32	80.40	22.21		110.0	
10062-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.40	66.89	16.61	0.49	100.0	± 9.6 %
		Y	4.48	66.72	16.41		100.0	
		Z	4.27	67.05	16.40		100.0	
10063-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.43	67.03	16.74	0.72	100.0	± 9.6 %
		Y	4.50	66.82	16.51		100.0	
		Z	4.29	67.16	16.50		100.0	
10064-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	4.66	67.22	16.93	0.86	100.0	± 9.6 %
		Y	4.74	67.02	16.71		100.0	
		Z	4.50	67.31	16.67		100.0	
10065-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	4.55	67.11	17.04	1.21	100.0	± 9.6 %
		Y	4.62	66.89	16.79		100.0	
		Z	4.38	67.12	16.73		100.0	
10066-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	4.57	67.14	17.22	1.46	100.0	± 9.6 %
		Y	4.64	66.91	16.95		100.0	
		Z	4.38	67.08	16.86		100.0	
10067-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	4.87	67.48	17.74	2.04	100.0	± 9.6 %
		Y	4.93	67.19	17.44		100.0	
		Z	4.65	67.30	17.29		100.0	
10068-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	4.92	67.43	17.92	2.55	100.0	± 9.6 %
		Y	4.97	67.13	17.61		100.0	
		Z	4.70	67.27	17.49		100.0	
10069-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	4.98	67.46	18.11	2.67	100.0	± 9.6 %
		Y	5.04	67.15	17.79		100.0	
		Z	4.74	67.23	17.63		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	4.75	67.16	17.60	1.99	100.0	± 9.6 %
		Y	4.79	66.87	17.29		100.0	
		Z	4.57	67.14	17.25		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	4.72	67.47	17.83	2.30	100.0	± 9.6 %
		Y	4.76	67.14	17.49		100.0	
		Z	4.51	67.32	17.42		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	4.81	67.75	18.22	2.83	100.0	± 9.6 %
		Y	4.83	67.34	17.84		100.0	
		Z	4.58	67.54	17.76		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	4.84	67.77	18.41	3.30	100.0	± 9.6 %
		Y	4.84	67.30	18.00		100.0	
		Z	4.61	67.56	17.94		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	4.88	67.82	18.68	3.82	90.0	± 9.6 %
		Y	4.87	67.35	18.27		90.0	
		Z	4.64	67.56	18.18		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	4.93	67.72	18.87	4.15	90.0	± 9.6 %
		Y	4.91	67.23	18.44		90.0	
		Z	4.68	67.42	18.33		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	4.97	67.84	18.99	4.30	90.0	± 9.6 %
		Y	4.95	67.34	18.55		90.0	
		Z	4.72	67.54	18.46		90.0	

10081-CAB	CDMA2000 (1xRTT, RC3)	X	0.36	60.00	6.17	0.00	150.0	± 9.6 %
		Y	0.59	63.42	9.69		150.0	
		Z	0.32	60.00	5.85		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	0.70	60.00	4.28	4.77	80.0	± 9.6 %
		Y	0.71	60.00	4.47		80.0	
		Z	0.69	60.00	2.91		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	111.63	25.26	6.56	60.0	± 9.6 %
		Y	100.00	111.84	25.29		60.0	
		Z	100.00	104.97	21.57		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.79	69.48	15.83	0.00	150.0	± 9.6 %
		Y	1.75	68.01	15.37		150.0	
		Z	1.85	70.58	16.07		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.75	69.43	15.81	0.00	150.0	± 9.6 %
		Y	1.71	67.95	15.34		150.0	
		Z	1.81	70.51	16.05		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	8.10	89.27	31.64	9.56	60.0	± 9.6 %
		Y	7.82	88.37	31.21		60.0	
		Z	5.91	83.06	29.00		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	2.93	70.65	16.93	0.00	150.0	± 9.6 %
		Y	2.91	69.88	16.50		150.0	
		Z	2.88	71.00	17.02		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.00	67.51	15.97	0.00	150.0	± 9.6 %
		Y	3.06	67.25	15.75		150.0	
		Z	2.95	67.78	15.94		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.11	67.54	16.09	0.00	150.0	± 9.6 %
		Y	3.17	67.28	15.86		150.0	
		Z	3.06	67.84	16.07		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	6.12	76.61	21.08	3.98	65.0	± 9.6 %
		Y	6.02	75.69	20.46		65.0	
		Z	5.04	74.42	19.98		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	5.76	73.36	20.41	3.98	65.0	± 9.6 %
		Y	5.82	73.01	20.04		65.0	
		Z	4.97	71.67	19.37		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	5.43	72.01	20.10	3.98	65.0	± 9.6 %
		Y	5.60	72.12	19.94		65.0	
		Z	4.63	70.08	18.95		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.52	70.18	16.82	0.00	150.0	± 9.6 %
		Y	2.51	69.21	16.32		150.0	
		Z	2.46	70.52	16.90		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.65	67.63	15.85	0.00	150.0	± 9.6 %
		Y	2.71	67.20	15.60		150.0	
		Z	2.60	68.02	15.83		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.00	69.56	16.26	0.00	150.0	± 9.6 %
		Y	2.00	68.38	15.78		150.0	
		Z	1.95	69.96	16.28		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.44	69.32	16.14	0.00	150.0	± 9.6 %
		Y	2.45	68.42	15.85		150.0	
		Z	2.47	70.27	16.29		150.0	

10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	2.78	67.70	15.93	0.00	150.0	± 9.6 %
		Y	2.84	67.29	15.69		150.0	
		Z	2.74	68.15	15.94		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.59	69.51	16.30	0.00	150.0	± 9.6 %
		Y	2.60	68.63	16.01		150.0	
		Z	2.62	70.47	16.44		150.0	
10114-CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	4.85	67.15	16.53	0.00	150.0	± 9.6 %
		Y	4.92	67.07	16.34		150.0	
		Z	4.74	67.31	16.39		150.0	
10115-CAB	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.09	67.20	16.55	0.00	150.0	± 9.6 %
		Y	5.17	67.14	16.39		150.0	
		Z	4.96	67.32	16.38		150.0	
10116-CAB	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	4.93	67.32	16.54	0.00	150.0	± 9.6 %
		Y	5.01	67.26	16.37		150.0	
		Z	4.80	67.45	16.39		150.0	
10117-CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	4.83	67.05	16.49	0.00	150.0	± 9.6 %
		Y	4.92	67.03	16.34		150.0	
		Z	4.72	67.21	16.36		150.0	
10118-CAB	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.18	67.45	16.68	0.00	150.0	± 9.6 %
		Y	5.24	67.32	16.48		150.0	
		Z	5.01	67.45	16.45		150.0	
10119-CAB	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	4.93	67.35	16.56	0.00	150.0	± 9.6 %
		Y	5.00	67.26	16.38		150.0	
		Z	4.81	67.49	16.41		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.12	67.54	15.99	0.00	150.0	± 9.6 %
		Y	3.19	67.29	15.77		150.0	
		Z	3.06	67.85	15.96		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.25	67.75	16.21	0.00	150.0	± 9.6 %
		Y	3.32	67.47	15.98		150.0	
		Z	3.20	68.12	16.21		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.74	69.31	15.23	0.00	150.0	± 9.6 %
		Y	1.76	68.27	15.08		150.0	
		Z	1.70	69.77	15.16		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.16	69.07	14.68	0.00	150.0	± 9.6 %
		Y	2.25	68.80	15.00		150.0	
		Z	2.14	69.68	14.51		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	1.74	65.28	12.23	0.00	150.0	± 9.6 %
		Y	1.92	65.76	12.95		150.0	
		Z	1.60	65.02	11.63		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	0.58	60.00	6.08	0.00	150.0	± 9.6 %
		Y	0.77	61.39	8.08		150.0	
		Z	0.51	60.00	5.48		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	0.86	60.00	5.96	0.00	150.0	± 9.6 %
		Y	1.06	60.98	7.22		150.0	
		Z	0.74	60.00	5.02		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	0.87	60.00	6.02	0.00	150.0	± 9.6 %
		Y	1.11	61.42	7.56		150.0	
		Z	0.75	60.00	5.07		150.0	

10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.66	67.71	15.91	0.00	150.0	± 9.6 %
		Y	2.72	67.28	15.65		150.0	
		Z	2.62	68.12	15.90		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	2.79	67.78	15.99	0.00	150.0	± 9.6 %
		Y	2.84	67.35	15.74		150.0	
		Z	2.75	68.24	16.00		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	6.77	80.29	22.54	3.98	65.0	± 9.6 %
		Y	6.33	78.29	21.53		65.0	
		Z	5.47	77.85	21.33		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	5.33	73.49	19.97	3.98	65.0	± 9.6 %
		Y	5.34	72.96	19.59		65.0	
		Z	4.49	71.58	18.77		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	5.80	74.93	21.00	3.98	65.0	± 9.6 %
		Y	5.76	74.19	20.51		65.0	
		Z	4.93	73.13	19.88		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.06	70.10	16.57	0.00	150.0	± 9.6 %
		Y	2.05	68.80	16.03		150.0	
		Z	2.02	70.56	16.62		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.44	69.38	16.19	0.00	150.0	± 9.6 %
		Y	2.45	68.46	15.88		150.0	
		Z	2.48	70.36	16.35		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.50	68.47	14.19	0.00	150.0	± 9.6 %
		Y	1.57	67.97	14.49		150.0	
		Z	1.45	68.72	13.95		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	1.49	64.88	11.44	0.00	150.0	± 9.6 %
		Y	1.72	65.90	12.60		150.0	
		Z	1.33	64.34	10.66		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.60	69.64	16.38	0.00	150.0	± 9.6 %
		Y	2.61	68.72	16.07		150.0	
		Z	2.64	70.64	16.53		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	1.55	65.11	11.61	0.00	150.0	± 9.6 %
		Y	1.80	66.26	12.82		150.0	
		Z	1.39	64.54	10.79		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.57	69.60	16.63	0.00	150.0	± 9.6 %
		Y	2.56	68.57	16.14		150.0	
		Z	2.47	69.70	16.54		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.67	67.78	15.84	0.00	150.0	± 9.6 %
		Y	2.73	67.32	15.62		150.0	
		Z	2.63	68.26	15.83		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	2.79	68.04	16.00	0.00	150.0	± 9.6 %
		Y	2.85	67.55	15.77		150.0	
		Z	2.75	68.57	16.01		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.17	69.79	19.57	3.01	150.0	± 9.6 %
		Y	3.20	68.89	18.78		150.0	
		Z	2.95	69.14	18.87		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	3.80	72.70	19.93	3.01	150.0	± 9.6 %
		Y	3.79	71.51	19.09		150.0	
		Z	3.55	72.23	19.31		150.0	

10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	4.49	76.44	22.00	3.01	150.0	± 9.6 %
		Y	4.31	74.34	20.75		150.0	
		Z	4.29	76.38	21.59		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	2.59	68.04	18.76	3.01	150.0	± 9.6 %
		Y	2.62	67.42	18.09		150.0	
		Z	2.53	67.98	18.27		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	3.49	74.23	21.37	3.01	150.0	± 9.6 %
		Y	3.41	72.75	20.32		150.0	
		Z	3.58	75.13	21.26		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	2.78	69.29	18.02	3.01	150.0	± 9.6 %
		Y	2.80	68.69	17.44		150.0	
		Z	2.71	69.37	17.54		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	5.88	87.05	27.69	6.02	65.0	± 9.6 %
		Y	5.30	83.58	25.79		65.0	
		Z	3.26	76.76	23.19		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	13.70	99.60	29.81	6.02	65.0	± 9.6 %
		Y	8.94	90.25	26.22		65.0	
		Z	7.04	88.51	25.48		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	8.59	90.19	26.23	6.02	65.0	± 9.6 %
		Y	7.13	85.48	24.05		65.0	
		Z	3.88	78.05	21.26		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	2.56	67.69	18.48	3.01	150.0	± 9.6 %
		Y	2.59	67.13	17.84		150.0	
		Z	2.49	67.60	17.97		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	3.50	74.26	21.39	3.01	150.0	± 9.6 %
		Y	3.41	72.77	20.34		150.0	
		Z	3.59	75.16	21.28		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	2.58	67.83	18.56	3.01	150.0	± 9.6 %
		Y	2.61	67.26	17.92		150.0	
		Z	2.51	67.74	18.05		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	3.47	74.07	21.28	3.01	150.0	± 9.6 %
		Y	3.39	72.61	20.24		150.0	
		Z	3.55	74.95	21.17		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	3.09	71.56	19.53	3.01	150.0	± 9.6 %
		Y	3.06	70.57	18.74		150.0	
		Z	3.07	71.92	19.18		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	2.77	69.24	17.98	3.01	150.0	± 9.6 %
		Y	2.80	68.64	17.41		150.0	
		Z	2.71	69.32	17.51		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	2.57	67.81	18.56	3.01	150.0	± 9.6 %
		Y	2.61	67.24	17.92		150.0	
		Z	2.50	67.72	18.05		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	3.47	74.04	21.27	3.01	150.0	± 9.6 %
		Y	3.38	72.59	20.23		150.0	
		Z	3.55	74.92	21.15		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	2.77	69.22	17.97	3.01	150.0	± 9.6 %
		Y	2.79	68.62	17.39		150.0	
		Z	2.70	69.30	17.49		150.0	

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	2.58	67.85	18.58	3.01	150.0	± 9.6 %
		Y	2.61	67.28	17.94		150.0	
		Z	2.51	67.77	18.07		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	3.48	74.12	21.31	3.01	150.0	± 9.6 %
		Y	3.40	72.66	20.27		150.0	
		Z	3.57	75.02	21.20		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	2.78	69.28	18.01	3.01	150.0	± 9.6 %
		Y	2.80	68.68	17.43		150.0	
		Z	2.72	69.36	17.53		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	2.59	67.95	18.68	3.01	150.0	± 9.6 %
		Y	2.63	67.36	18.02		150.0	
		Z	2.53	67.88	18.18		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	3.60	74.88	21.75	3.01	150.0	± 9.6 %
		Y	3.49	73.27	20.64		150.0	
		Z	3.72	75.91	21.69		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	2.84	69.72	18.31	3.01	150.0	± 9.6 %
		Y	2.86	69.05	17.69		150.0	
		Z	2.78	69.83	17.84		150.0	
10193-CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.24	66.83	16.19	0.00	150.0	± 9.6 %
		Y	4.33	66.71	16.05		150.0	
		Z	4.17	67.21	16.12		150.0	
10194-CAB	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.38	67.05	16.33	0.00	150.0	± 9.6 %
		Y	4.48	66.96	16.18		150.0	
		Z	4.29	67.37	16.25		150.0	
10195-CAB	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.41	67.06	16.34	0.00	150.0	± 9.6 %
		Y	4.51	66.98	16.20		150.0	
		Z	4.31	67.35	16.24		150.0	
10196-CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.22	66.81	16.17	0.00	150.0	± 9.6 %
		Y	4.32	66.72	16.04		150.0	
		Z	4.14	67.17	16.09		150.0	
10197-CAB	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.38	67.05	16.33	0.00	150.0	± 9.6 %
		Y	4.48	66.96	16.19		150.0	
		Z	4.29	67.37	16.25		150.0	
10198-CAB	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.40	67.05	16.34	0.00	150.0	± 9.6 %
		Y	4.51	66.98	16.20		150.0	
		Z	4.30	67.34	16.24		150.0	
10219-CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.18	66.86	16.15	0.00	150.0	± 9.6 %
		Y	4.27	66.75	16.01		150.0	
		Z	4.10	67.24	16.08		150.0	
10220-CAB	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.38	67.01	16.32	0.00	150.0	± 9.6 %
		Y	4.48	66.92	16.17		150.0	
		Z	4.28	67.32	16.23		150.0	
10221-CAB	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.42	67.00	16.33	0.00	150.0	± 9.6 %
		Y	4.52	66.92	16.19		150.0	
		Z	4.32	67.30	16.23		150.0	
10222-CAB	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	4.81	67.05	16.49	0.00	150.0	± 9.6 %
		Y	4.89	67.00	16.32		150.0	
		Z	4.70	67.21	16.35		150.0	

10223-CAB	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.06	67.21	16.57	0.00	150.0	± 9.6 %
		Y	5.16	67.20	16.44		150.0	
		Z	4.91	67.28	16.38		150.0	
10224-CAB	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	4.85	67.17	16.47	0.00	150.0	± 9.6 %
		Y	4.93	67.12	16.31		150.0	
		Z	4.74	67.36	16.35		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.51	66.34	14.80	0.00	150.0	± 9.6 %
		Y	2.61	66.13	14.83		150.0	
		Z	2.46	66.75	14.59		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	15.41	101.95	30.62	6.02	65.0	± 9.6 %
		Y	9.61	91.66	26.78		65.0	
		Z	7.80	90.47	26.24		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	15.19	100.12	29.36	6.02	65.0	± 9.6 %
		Y	9.40	90.05	25.60		65.0	
		Z	7.35	88.27	24.80		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	7.70	93.10	29.94	6.02	65.0	± 9.6 %
		Y	6.07	86.55	26.97		65.0	
		Z	4.20	82.08	25.39		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	13.82	99.74	29.86	6.02	65.0	± 9.6 %
		Y	9.01	90.36	26.26		65.0	
		Z	7.11	88.67	25.54		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	13.48	97.89	28.61	6.02	65.0	± 9.6 %
		Y	8.74	88.75	25.10		65.0	
		Z	6.65	86.51	24.13		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	7.23	91.68	29.37	6.02	65.0	± 9.6 %
		Y	5.81	85.62	26.55		65.0	
		Z	4.00	81.04	24.89		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	13.79	99.72	29.85	6.02	65.0	± 9.6 %
		Y	8.99	90.35	26.26		65.0	
		Z	7.09	88.64	25.54		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	13.43	97.83	28.60	6.02	65.0	± 9.6 %
		Y	8.72	88.71	25.09		65.0	
		Z	6.62	86.46	24.12		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	6.91	90.59	28.86	6.02	65.0	± 9.6 %
		Y	5.61	84.84	26.14		65.0	
		Z	3.86	80.24	24.45		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	13.83	99.78	29.87	6.02	65.0	± 9.6 %
		Y	9.00	90.38	26.27		65.0	
		Z	7.09	88.66	25.55		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	13.62	98.04	28.65	6.02	65.0	± 9.6 %
		Y	8.81	88.86	25.13		65.0	
		Z	6.70	86.60	24.16		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	7.24	91.74	29.39	6.02	65.0	± 9.6 %
		Y	5.81	85.65	26.56		65.0	
		Z	3.99	81.03	24.90		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	13.76	99.70	29.84	6.02	65.0	± 9.6 %
		Y	8.97	90.32	26.25		65.0	
		Z	7.07	88.61	25.52		65.0	

10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	13.37	97.78	28.58	6.02	65.0	± 9.6 %
		Y	8.69	88.67	25.08		65.0	
		Z	6.59	86.40	24.10		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	7.22	91.71	29.38	6.02	65.0	± 9.6 %
		Y	5.80	85.63	26.55		65.0	
		Z	3.99	81.03	24.89		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	7.92	83.31	26.43	6.98	65.0	± 9.6 %
		Y	7.39	80.86	25.11		65.0	
		Z	6.39	80.34	24.81		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	7.05	80.89	25.37	6.98	65.0	± 9.6 %
		Y	6.86	79.38	24.43		65.0	
		Z	5.31	76.70	23.25		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	5.61	76.83	24.61	6.98	65.0	± 9.6 %
		Y	5.60	75.93	23.88		65.0	
		Z	4.41	73.05	22.53		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	4.02	70.41	14.69	3.98	65.0	± 9.6 %
		Y	4.13	70.49	14.93		65.0	
		Z	2.49	65.11	11.00		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	3.85	69.59	14.25	3.98	65.0	± 9.6 %
		Y	4.01	69.84	14.58		65.0	
		Z	2.45	64.72	10.74		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	4.04	73.92	16.51	3.98	65.0	± 9.6 %
		Y	4.21	74.30	17.06		65.0	
		Z	2.46	68.40	13.32		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	4.12	71.43	16.28	3.98	65.0	± 9.6 %
		Y	4.26	71.62	16.65		65.0	
		Z	3.07	68.30	14.10		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	3.99	70.52	15.86	3.98	65.0	± 9.6 %
		Y	4.18	70.90	16.31		65.0	
		Z	2.99	67.51	13.71		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	7.21	83.53	21.70	3.98	65.0	± 9.6 %
		Y	6.04	80.32	20.70		65.0	
		Z	4.60	77.74	18.93		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	5.73	77.13	21.21	3.98	65.0	± 9.6 %
		Y	5.49	75.70	20.56		65.0	
		Z	4.71	74.90	19.83		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	5.08	73.68	19.28	3.98	65.0	± 9.6 %
		Y	5.08	73.10	19.02		65.0	
		Z	4.15	71.43	17.80		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	7.72	84.95	23.95	3.98	65.0	± 9.6 %
		Y	6.57	81.27	22.47		65.0	
		Z	5.73	81.18	22.23		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	5.25	73.10	19.66	3.98	65.0	± 9.6 %
		Y	5.27	72.57	19.33		65.0	
		Z	4.44	71.27	18.45		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	5.65	74.31	20.52	3.98	65.0	± 9.6 %
		Y	5.63	73.63	20.11		65.0	
		Z	4.81	72.54	19.36		65.0	

10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	6.41	79.52	22.36	3.98	65.0	± 9.6 %
		Y	6.03	77.61	21.41		65.0	
		Z	5.18	77.05	21.09		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	2.62	64.77	10.66	3.98	65.0	± 9.6 %
		Y	2.89	65.71	11.45		65.0	
		Z	1.74	61.55	7.76		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	2.56	64.22	10.26	3.98	65.0	± 9.6 %
		Y	2.83	65.16	11.06		65.0	
		Z	1.73	61.29	7.50		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	2.33	65.98	11.67	3.98	65.0	± 9.6 %
		Y	2.74	67.85	13.09		65.0	
		Z	1.55	62.66	9.04		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	4.78	73.82	18.19	3.98	65.0	± 9.6 %
		Y	4.76	73.30	18.14		65.0	
		Z	3.71	70.96	16.29		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	4.75	73.36	17.98	3.98	65.0	± 9.6 %
		Y	4.77	72.96	17.98		65.0	
		Z	3.71	70.59	16.10		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	7.00	83.14	22.24	3.98	65.0	± 9.6 %
		Y	5.96	79.88	21.10		65.0	
		Z	4.89	78.58	20.00		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	5.70	77.00	21.13	3.98	65.0	± 9.6 %
		Y	5.47	75.60	20.50		65.0	
		Z	4.68	74.76	19.75		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.08	73.66	19.27	3.98	65.0	± 9.6 %
		Y	5.07	73.07	19.02		65.0	
		Z	4.15	71.42	17.80		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	7.58	84.58	23.79	3.98	65.0	± 9.6 %
		Y	6.49	81.02	22.35		65.0	
		Z	5.63	80.83	22.06		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	5.33	73.50	19.98	3.98	65.0	± 9.6 %
		Y	5.34	72.96	19.60		65.0	
		Z	4.49	71.58	18.78		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	5.80	74.91	20.98	3.98	65.0	± 9.6 %
		Y	5.76	74.17	20.50		65.0	
		Z	4.93	73.11	19.87		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	6.75	80.22	22.51	3.98	65.0	± 9.6 %
		Y	6.31	78.24	21.51		65.0	
		Z	5.45	77.78	21.30		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	5.93	73.37	20.49	3.98	65.0	± 9.6 %
		Y	5.99	73.01	20.12		65.0	
		Z	5.16	71.83	19.50		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	5.93	72.96	20.33	3.98	65.0	± 9.6 %
		Y	5.99	72.64	20.00		65.0	
		Z	5.19	71.51	19.38		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	6.27	76.42	21.20	3.98	65.0	± 9.6 %
		Y	6.15	75.42	20.55		65.0	
		Z	5.37	74.84	20.32		65.0	

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.38	67.09	14.90	0.00	150.0	± 9.6 %
		Y	2.44	66.67	14.85		150.0	
		Z	2.34	67.57	14.77		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.49	69.19	15.59	0.00	150.0	± 9.6 %
		Y	1.48	67.68	15.09		150.0	
		Z	1.49	69.77	15.72		150.0	
10277-CAA	PHS (QPSK)	X	2.09	60.92	6.52	9.03	50.0	± 9.6 %
		Y	1.99	60.88	6.43		50.0	
		Z	1.56	59.12	4.50		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	3.33	66.21	11.58	9.03	50.0	± 9.6 %
		Y	3.45	67.40	12.36		50.0	
		Z	2.52	63.38	9.00		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	3.39	66.39	11.72	9.03	50.0	± 9.6 %
		Y	3.53	67.62	12.52		50.0	
		Z	2.56	63.50	9.12		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	0.61	61.53	7.60	0.00	150.0	± 9.6 %
		Y	0.95	65.07	10.75		150.0	
		Z	0.49	60.68	6.68		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	0.35	60.00	6.15	0.00	150.0	± 9.6 %
		Y	0.58	63.25	9.58		150.0	
		Z	0.32	60.00	5.83		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	0.39	61.31	7.18	0.00	150.0	± 9.6 %
		Y	0.79	67.34	11.99		150.0	
		Z	0.36	61.33	6.91		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	0.70	66.46	10.24	0.00	150.0	± 9.6 %
		Y	1.84	77.49	16.58		150.0	
		Z	0.96	69.80	11.25		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	24.25	96.58	25.60	9.03	50.0	± 9.6 %
		Y	13.21	88.89	23.79		50.0	
		Z	17.74	90.30	22.44		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.54	70.33	16.91	0.00	150.0	± 9.6 %
		Y	2.52	69.32	16.40		150.0	
		Z	2.48	70.69	17.00		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	0.87	62.84	9.39	0.00	150.0	± 9.6 %
		Y	1.14	64.99	11.49		150.0	
		Z	0.74	62.03	8.44		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	1.31	62.98	9.06	0.00	150.0	± 9.6 %
		Y	1.60	64.50	10.42		150.0	
		Z	0.95	60.67	6.76		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	1.06	60.58	7.00	0.00	150.0	± 9.6 %
		Y	1.28	61.71	8.21		150.0	
		Z	0.80	59.16	5.20		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	4.72	67.05	17.86	4.17	50.0	± 9.6 %
		Y	4.49	65.52	17.15		50.0	
		Z	4.22	65.84	16.97		50.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.04	66.76	18.08	4.96	50.0	± 9.6 %
		Y	5.00	66.22	17.91		50.0	
		Z	4.64	66.13	17.51		50.0	

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.99	67.71	18.65	4.96	50.0	± 9.6 %
		Y	4.76	65.90	17.73		50.0	
		Z	4.52	66.56	17.75		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.61	66.36	17.42	4.17	50.0	± 9.6 %
		Y	4.57	65.80	17.25		50.0	
		Z	4.26	65.88	16.92		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	5.19	72.10	20.50	6.02	35.0	± 9.6 %
		Y	4.47	68.84	19.43		35.0	
		Z	4.13	68.52	18.41		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	5.03	69.52	19.81	6.02	35.0	± 9.6 %
		Y	4.66	67.41	19.03		35.0	
		Z	4.34	67.36	18.35		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.97	69.79	19.79	6.02	35.0	± 9.6 %
		Y	4.56	67.54	18.97		35.0	
		Z	4.24	67.41	18.25		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	5.00	70.20	20.02	6.02	35.0	± 9.6 %
		Y	4.56	67.81	19.14		35.0	
		Z	4.23	67.67	18.42		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	5.04	69.58	19.90	6.02	35.0	± 9.6 %
		Y	4.68	67.50	19.12		35.0	
		Z	4.34	67.37	18.43		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	5.02	69.73	19.86	6.02	35.0	± 9.6 %
		Y	4.62	67.52	19.04		35.0	
		Z	4.31	67.48	18.38		35.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	2.89	69.32	16.51	0.00	150.0	± 9.6 %
		Y	2.88	68.58	16.07		150.0	
		Z	2.84	69.69	16.60		150.0	
10313-AAA	iDEN 1:3	X	3.64	73.80	16.25	6.99	70.0	± 9.6 %
		Y	3.53	73.47	16.27		70.0	
		Z	2.54	70.98	14.85		70.0	
10314-AAA	iDEN 1:6	X	11.36	92.32	25.29	10.00	30.0	± 9.6 %
		Y	6.23	84.01	23.01		30.0	
		Z	14.41	96.78	26.22		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	0.98	64.50	15.61	0.17	150.0	± 9.6 %
		Y	1.03	63.67	14.93		150.0	
		Z	0.98	64.65	15.49		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.29	66.82	16.34	0.17	150.0	± 9.6 %
		Y	4.37	66.68	16.16		150.0	
		Z	4.17	67.03	16.16		150.0	
10317-AAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.29	66.82	16.34	0.17	150.0	± 9.6 %
		Y	4.37	66.68	16.16		150.0	
		Z	4.17	67.03	16.16		150.0	
10400-AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.33	67.02	16.29	0.00	150.0	± 9.6 %
		Y	4.44	66.95	16.15		150.0	
		Z	4.21	67.24	16.15		150.0	
10401-AAC	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	4.99	66.73	16.28	0.00	150.0	± 9.6 %
		Y	5.10	66.79	16.18		150.0	
		Z	4.87	66.89	16.13		150.0	

10402-AAC	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.36	67.33	16.49	0.00	150.0	± 9.6 %
		Y	5.44	67.34	16.35		150.0	
		Z	5.26	67.52	16.37		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	0.61	61.53	7.60	0.00	115.0	± 9.6 %
		Y	0.95	65.07	10.75		115.0	
		Z	0.49	60.68	6.68		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	0.61	61.53	7.60	0.00	115.0	± 9.6 %
		Y	0.95	65.07	10.75		115.0	
		Z	0.49	60.68	6.68		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	120.88	29.11	0.00	100.0	± 9.6 %
		Y	100.00	119.48	28.73		100.0	
		Z	100.00	111.63	24.58		100.0	
10410-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	127.51	32.08	3.23	80.0	± 9.6 %
		Y	31.82	108.36	26.95		80.0	
		Z	62.35	116.51	27.82		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	0.90	63.50	14.92	0.00	150.0	± 9.6 %
		Y	0.97	62.93	14.41		150.0	
		Z	0.93	63.99	15.00		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.23	66.80	16.26	0.00	150.0	± 9.6 %
		Y	4.33	66.70	16.12		150.0	
		Z	4.15	67.12	16.17		150.0	
10417-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.23	66.80	16.26	0.00	150.0	± 9.6 %
		Y	4.33	66.70	16.12		150.0	
		Z	4.15	67.12	16.17		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.23	67.03	16.33	0.00	150.0	± 9.6 %
		Y	4.32	66.91	16.17		150.0	
		Z	4.14	67.37	16.26		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.24	66.95	16.31	0.00	150.0	± 9.6 %
		Y	4.34	66.84	16.16		150.0	
		Z	4.16	67.28	16.23		150.0	
10422-AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.35	66.91	16.32	0.00	150.0	± 9.6 %
		Y	4.45	66.82	16.17		150.0	
		Z	4.26	67.23	16.23		150.0	
10423-AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.47	67.16	16.40	0.00	150.0	± 9.6 %
		Y	4.57	67.08	16.26		150.0	
		Z	4.36	67.46	16.30		150.0	
10424-AAA	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.40	67.11	16.38	0.00	150.0	± 9.6 %
		Y	4.50	67.03	16.24		150.0	
		Z	4.30	67.40	16.28		150.0	
10425-AAA	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.04	67.26	16.58	0.00	150.0	± 9.6 %
		Y	5.13	67.22	16.42		150.0	
		Z	4.89	67.32	16.38		150.0	
10426-AAA	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.08	67.43	16.66	0.00	150.0	± 9.6 %
		Y	5.14	67.30	16.46		150.0	
		Z	4.92	67.46	16.45		150.0	

10427-AAA	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.02	67.13	16.51	0.00	150.0	± 9.6 %
		Y	5.11	67.10	16.36		150.0	
		Z	4.90	67.29	16.36		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.47	74.13	19.05	0.00	150.0	± 9.6 %
		Y	4.27	72.47	18.45		150.0	
		Z	5.08	77.10	19.89		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	3.84	67.47	16.10	0.00	150.0	± 9.6 %
		Y	3.94	67.28	15.99		150.0	
		Z	3.74	67.83	15.98		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.16	67.25	16.30	0.00	150.0	± 9.6 %
		Y	4.27	67.12	16.16		150.0	
		Z	4.06	67.58	16.20		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.42	67.15	16.40	0.00	150.0	± 9.6 %
		Y	4.52	67.06	16.26		150.0	
		Z	4.32	67.45	16.31		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.64	75.00	18.70	0.00	150.0	± 9.6 %
		Y	4.40	73.39	18.26		150.0	
		Z	5.41	78.17	19.50		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	127.19	31.93	3.23	80.0	± 9.6 %
		Y	27.78	106.36	26.40		80.0	
		Z	42.85	111.62	26.64		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.04	67.08	14.65	0.00	150.0	± 9.6 %
		Y	3.18	67.05	14.85		150.0	
		Z	2.91	67.25	14.30		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	3.71	67.27	15.98	0.00	150.0	± 9.6 %
		Y	3.81	67.07	15.86		150.0	
		Z	3.62	67.65	15.87		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.01	67.09	16.21	0.00	150.0	± 9.6 %
		Y	4.11	66.95	16.06		150.0	
		Z	3.92	67.43	16.12		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.22	66.93	16.26	0.00	150.0	± 9.6 %
		Y	4.32	66.84	16.11		150.0	
		Z	4.14	67.24	16.18		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	2.79	66.50	13.63	0.00	150.0	± 9.6 %
		Y	2.98	66.79	14.09		150.0	
		Z	2.59	66.31	13.04		150.0	
10456-AAA	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.00	67.78	16.73	0.00	150.0	± 9.6 %
		Y	6.04	67.74	16.57		150.0	
		Z	6.02	68.38	16.82		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.60	65.57	16.01	0.00	150.0	± 9.6 %
		Y	3.68	65.45	15.84		150.0	
		Z	3.57	66.00	15.95		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	2.28	64.00	11.72	0.00	150.0	± 9.6 %
		Y	2.41	64.11	12.28		150.0	
		Z	1.90	62.62	10.39		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	4.90	70.07	18.22	0.00	150.0	± 9.6 %
		Y	4.93	69.48	18.09		150.0	
		Z	5.05	71.41	18.27		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	0.94	72.42	17.37	0.00	150.0	± 9.6 %
		Y	0.82	67.88	15.60		150.0	
		Z	0.96	72.94	17.69		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	133.76	34.95	3.29	80.0	± 9.6 %
		Y	22.54	106.56	27.45		80.0	
		Z	100.00	126.80	31.21		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.53	66.28	11.09	3.23	80.0	± 9.6 %
		Y	0.98	61.72	9.01		80.0	
		Z	0.66	60.00	6.84		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.60	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.56		80.0	
		Z	0.36	55.81	3.91		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	130.06	33.08	3.23	80.0	± 9.6 %
		Y	13.20	97.62	24.36		80.0	
		Z	92.51	120.86	28.60		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.21	64.05	10.09	3.23	80.0	± 9.6 %
		Y	0.92	61.09	8.63		80.0	
		Z	0.66	60.00	6.77		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.55	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.52		80.0	
		Z	0.35	55.73	3.83		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	130.58	33.30	3.23	80.0	± 9.6 %
		Y	16.52	100.70	25.21		80.0	
		Z	100.00	122.35	29.03		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.29	64.72	10.40	3.23	80.0	± 9.6 %
		Y	0.94	61.28	8.75		80.0	
		Z	0.66	60.00	6.80		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.55	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.52		80.0	
		Z	0.35	55.73	3.83		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	130.62	33.31	3.23	80.0	± 9.6 %
		Y	16.78	100.92	25.26		80.0	
		Z	100.00	122.35	29.02		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.27	64.59	10.33	3.23	80.0	± 9.6 %
		Y	0.93	61.24	8.72		80.0	
		Z	0.66	60.00	6.79		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.53	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.50		80.0	
		Z	0.35	55.70	3.80		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	130.57	33.29	3.23	80.0	± 9.6 %
		Y	16.58	100.74	25.21		80.0	
		Z	100.00	122.30	29.00		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.26	64.53	10.31	3.23	80.0	± 9.6 %
		Y	0.93	61.22	8.71		80.0	
		Z	0.66	60.00	6.78		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.54	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.50		80.0	
		Z	0.35	55.70	3.80		80.0	

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.20	64.02	10.06	3.23	80.0	± 9.6 %
		Y	0.91	61.06	8.60		80.0	
		Z	0.66	60.00	6.75		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.79	60.00	7.52	3.23	80.0	± 9.6 %
		Y	0.83	60.00	7.49		80.0	
		Z	0.35	55.68	3.77		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	126.79	33.21	3.23	80.0	± 9.6 %
		Y	10.38	91.55	23.92		80.0	
		Z	100.00	123.17	30.88		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	111.12	25.93	3.23	80.0	± 9.6 %
		Y	4.86	75.90	16.60		80.0	
		Z	2.50	69.40	12.93		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	17.33	89.29	19.94	3.23	80.0	± 9.6 %
		Y	3.20	70.44	14.16		80.0	
		Z	1.42	63.47	9.98		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.01	67.85	13.24	2.23	80.0	± 9.6 %
		Y	2.00	67.46	13.68		80.0	
		Z	1.08	62.21	9.90		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.20	65.59	11.72	2.23	80.0	± 9.6 %
		Y	2.17	65.07	11.85		80.0	
		Z	1.15	60.00	7.79		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.02	64.43	11.18	2.23	80.0	± 9.6 %
		Y	2.09	64.36	11.51		80.0	
		Z	1.17	60.00	7.77		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.53	79.22	19.45	2.23	80.0	± 9.6 %
		Y	2.84	72.10	17.06		80.0	
		Z	2.60	72.67	16.45		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.56	67.74	14.01	2.23	80.0	± 9.6 %
		Y	2.53	67.08	14.11		80.0	
		Z	1.74	64.04	11.62		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.49	67.00	13.65	2.23	80.0	± 9.6 %
		Y	2.51	66.63	13.88		80.0	
		Z	1.72	63.54	11.33		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.03	76.67	20.22	2.23	80.0	± 9.6 %
		Y	3.18	71.86	18.18		80.0	
		Z	2.98	73.13	18.53		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.48	70.97	17.69	2.23	80.0	± 9.6 %
		Y	3.17	68.69	16.67		80.0	
		Z	2.92	69.30	16.55		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.52	70.58	17.52	2.23	80.0	± 9.6 %
		Y	3.25	68.52	16.59		80.0	
		Z	2.96	68.98	16.39		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.82	73.14	19.18	2.23	80.0	± 9.6 %
		Y	3.42	70.39	17.81		80.0	
		Z	3.09	70.86	17.98		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.66	69.39	17.61	2.23	80.0	± 9.6 %
		Y	3.51	67.96	16.83		80.0	
		Z	3.20	68.22	16.75		80.0	

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.70	69.16	17.50	2.23	80.0	± 9.6 %
		Y	3.57	67.83	16.77		80.0	
		Z	3.24	68.04	16.65		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.24	74.94	19.81	2.23	80.0	± 9.6 %
		Y	3.67	71.70	18.26		80.0	
		Z	3.36	72.30	18.54		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	69.69	17.88	2.23	80.0	± 9.6 %
		Y	3.54	68.22	17.04		80.0	
		Z	3.22	68.45	17.03		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.75	69.34	17.76	2.23	80.0	± 9.6 %
		Y	3.62	68.01	16.98		80.0	
		Z	3.30	68.22	16.94		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	0.96	60.00	7.89	2.23	80.0	± 9.6 %
		Y	1.15	61.18	9.30		80.0	
		Z	0.83	60.00	6.90		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.15	60.00	6.67	2.23	80.0	± 9.6 %
		Y	1.20	60.00	7.47		80.0	
		Z	1.06	60.00	5.55		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.17	60.00	6.51	2.23	80.0	± 9.6 %
		Y	1.22	60.00	7.31		80.0	
		Z	1.10	60.00	5.36		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.27	78.15	19.77	2.23	80.0	± 9.6 %
		Y	2.97	71.96	17.50		80.0	
		Z	2.82	73.28	17.46		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.13	69.97	15.82	2.23	80.0	± 9.6 %
		Y	2.87	68.14	15.28		80.0	
		Z	2.33	67.02	13.92		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.10	69.46	15.52	2.23	80.0	± 9.6 %
		Y	2.89	67.91	15.09		80.0	
		Z	2.32	66.58	13.62		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.94	76.31	20.06	2.23	80.0	± 9.6 %
		Y	3.14	71.64	18.07		80.0	
		Z	2.92	72.80	18.38		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.45	70.79	17.60	2.23	80.0	± 9.6 %
		Y	3.15	68.57	16.60		80.0	
		Z	2.89	69.12	16.44		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.49	70.43	17.43	2.23	80.0	± 9.6 %
		Y	3.23	68.41	16.53		80.0	
		Z	2.93	68.82	16.30		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.19	74.72	19.70	2.23	80.0	± 9.6 %
		Y	3.64	71.54	18.18		80.0	
		Z	3.32	72.09	18.43		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.67	69.60	17.83	2.23	80.0	± 9.6 %
		Y	3.52	68.16	17.00		80.0	
		Z	3.21	68.36	16.97		80.0	

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.73	69.24	17.70	2.23	80.0	± 9.6 %
		Y	3.60	67.93	16.93		80.0	
		Z	3.28	68.12	16.88		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.33	72.38	18.83	2.23	80.0	± 9.6 %
		Y	4.02	70.46	17.77		80.0	
		Z	3.67	70.70	17.93		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.06	68.76	17.68	2.23	80.0	± 9.6 %
		Y	3.99	67.84	17.05		80.0	
		Z	3.63	67.77	16.97		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.12	68.51	17.60	2.23	80.0	± 9.6 %
		Y	4.06	67.66	17.00		80.0	
		Z	3.70	67.61	16.92		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.60	74.13	19.39	2.23	80.0	± 9.6 %
		Y	4.14	71.72	18.16		80.0	
		Z	3.79	72.01	18.34		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.97	68.97	17.79	2.23	80.0	± 9.6 %
		Y	3.88	67.99	17.12		80.0	
		Z	3.53	67.87	17.05		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.99	68.53	17.64	2.23	80.0	± 9.6 %
		Y	3.92	67.65	17.02		80.0	
		Z	3.57	67.54	16.93		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.86	63.76	15.01	0.00	150.0	± 9.6 %
		Y	0.93	63.09	14.45		150.0	
		Z	0.89	64.24	15.10		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	1.36	87.46	22.75	0.00	150.0	± 9.6 %
		Y	0.54	69.72	16.60		150.0	
		Z	0.87	81.18	21.47		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.73	66.61	16.01	0.00	150.0	± 9.6 %
		Y	0.76	64.78	14.94		150.0	
		Z	0.75	66.85	16.09		150.0	
10518-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.22	66.92	16.26	0.00	150.0	± 9.6 %
		Y	4.32	66.81	16.11		150.0	
		Z	4.14	67.26	16.18		150.0	
10519-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.36	67.07	16.34	0.00	150.0	± 9.6 %
		Y	4.47	66.97	16.20		150.0	
		Z	4.26	67.39	16.25		150.0	
10520-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.22	67.01	16.26	0.00	150.0	± 9.6 %
		Y	4.32	66.91	16.11		150.0	
		Z	4.13	67.32	16.17		150.0	
10521-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.15	66.96	16.24	0.00	150.0	± 9.6 %
		Y	4.26	66.88	16.09		150.0	
		Z	4.06	67.26	16.14		150.0	
10522-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.20	67.07	16.32	0.00	150.0	± 9.6 %
		Y	4.31	66.99	16.18		150.0	
		Z	4.08	67.30	16.18		150.0	

10523-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.14	67.14	16.28	0.00	150.0	± 9.6 %
		Y	4.23	67.00	16.11		150.0	
		Z	4.06	67.51	16.23		150.0	
10524-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.15	67.07	16.34	0.00	150.0	± 9.6 %
		Y	4.26	66.95	16.18		150.0	
		Z	4.06	67.37	16.24		150.0	
10525-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.20	66.19	15.97	0.00	150.0	± 9.6 %
		Y	4.29	66.07	15.81		150.0	
		Z	4.13	66.56	15.92		150.0	
10526-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.31	66.45	16.08	0.00	150.0	± 9.6 %
		Y	4.41	66.35	15.92		150.0	
		Z	4.22	66.77	16.00		150.0	
10527-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.25	66.43	16.02	0.00	150.0	± 9.6 %
		Y	4.34	66.31	15.86		150.0	
		Z	4.16	66.77	15.96		150.0	
10528-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.26	66.44	16.06	0.00	150.0	± 9.6 %
		Y	4.36	66.33	15.89		150.0	
		Z	4.17	66.77	15.98		150.0	
10529-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.26	66.44	16.06	0.00	150.0	± 9.6 %
		Y	4.36	66.33	15.89		150.0	
		Z	4.17	66.77	15.98		150.0	
10531-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.22	66.45	16.02	0.00	150.0	± 9.6 %
		Y	4.32	66.35	15.87		150.0	
		Z	4.12	66.75	15.94		150.0	
10532-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.11	66.31	15.96	0.00	150.0	± 9.6 %
		Y	4.21	66.22	15.80		150.0	
		Z	4.02	66.64	15.89		150.0	
10533-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.27	66.54	16.06	0.00	150.0	± 9.6 %
		Y	4.36	66.41	15.90		150.0	
		Z	4.17	66.88	15.99		150.0	
10534-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	4.83	66.36	16.12	0.00	150.0	± 9.6 %
		Y	4.92	66.33	15.96		150.0	
		Z	4.73	66.59	16.01		150.0	
10535-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	4.87	66.48	16.17	0.00	150.0	± 9.6 %
		Y	4.96	66.46	16.02		150.0	
		Z	4.75	66.66	16.05		150.0	
10536-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	4.76	66.48	16.15	0.00	150.0	± 9.6 %
		Y	4.85	66.46	16.00		150.0	
		Z	4.66	66.70	16.05		150.0	
10537-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	4.84	66.54	16.18	0.00	150.0	± 9.6 %
		Y	4.91	66.45	16.00		150.0	
		Z	4.73	66.74	16.07		150.0	
10538-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	4.89	66.44	16.17	0.00	150.0	± 9.6 %
		Y	4.98	66.41	16.02		150.0	
		Z	4.77	66.62	16.04		150.0	
10540-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	4.82	66.39	16.17	0.00	150.0	± 9.6 %
		Y	4.91	66.37	16.02		150.0	
		Z	4.71	66.59	16.05		150.0	

10541-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	4.81	66.32	16.11	0.00	150.0	± 9.6 %
		Y	4.89	66.29	15.96		150.0	
		Z	4.71	66.57	16.02		150.0	
10542-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	4.96	66.42	16.18	0.00	150.0	± 9.6 %
		Y	5.05	66.39	16.03		150.0	
		Z	4.85	66.63	16.06		150.0	
10543-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.05	66.57	16.28	0.00	150.0	± 9.6 %
		Y	5.12	66.46	16.09		150.0	
		Z	4.92	66.71	16.13		150.0	
10544-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.19	66.38	16.08	0.00	150.0	± 9.6 %
		Y	5.26	66.41	15.96		150.0	
		Z	5.09	66.58	15.97		150.0	
10545-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.38	66.91	16.31	0.00	150.0	± 9.6 %
		Y	5.43	66.83	16.13		150.0	
		Z	5.23	66.94	16.11		150.0	
10546-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.22	66.50	16.11	0.00	150.0	± 9.6 %
		Y	5.29	66.53	15.99		150.0	
		Z	5.11	66.68	15.99		150.0	
10547-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.33	66.73	16.22	0.00	150.0	± 9.6 %
		Y	5.37	66.64	16.03		150.0	
		Z	5.21	66.86	16.08		150.0	
10548-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.45	67.31	16.49	0.00	150.0	± 9.6 %
		Y	5.51	67.24	16.31		150.0	
		Z	5.25	67.19	16.22		150.0	
10550-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.32	66.85	16.30	0.00	150.0	± 9.6 %
		Y	5.35	66.71	16.09		150.0	
		Z	5.18	66.94	16.14		150.0	
10551-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.20	66.44	16.06	0.00	150.0	± 9.6 %
		Y	5.29	66.50	15.95		150.0	
		Z	5.09	66.62	15.94		150.0	
10552-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.19	66.51	16.09	0.00	150.0	± 9.6 %
		Y	5.27	66.53	15.96		150.0	
		Z	5.10	66.75	16.00		150.0	
10553-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.24	66.43	16.08	0.00	150.0	± 9.6 %
		Y	5.33	66.48	15.97		150.0	
		Z	5.14	66.64	15.98		150.0	
10554-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.62	66.70	16.16	0.00	150.0	± 9.6 %
		Y	5.68	66.74	16.03		150.0	
		Z	5.52	66.86	16.02		150.0	
10555-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	5.71	66.93	16.26	0.00	150.0	± 9.6 %
		Y	5.77	66.97	16.13		150.0	
		Z	5.58	67.01	16.08		150.0	
10556-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	5.77	67.11	16.34	0.00	150.0	± 9.6 %
		Y	5.81	67.07	16.17		150.0	
		Z	5.62	67.15	16.14		150.0	
10557-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	5.70	66.90	16.25	0.00	150.0	± 9.6 %
		Y	5.77	66.95	16.13		150.0	
		Z	5.59	67.04	16.11		150.0	

10558-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	5.69	66.90	16.26	0.00	150.0	± 9.6 %
		Y	5.78	67.01	16.18		150.0	
		Z	5.56	67.00	16.10		150.0	
10560-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	5.72	66.86	16.28	0.00	150.0	± 9.6 %
		Y	5.80	66.93	16.18		150.0	
		Z	5.60	66.99	16.14		150.0	
10561-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.66	66.87	16.32	0.00	150.0	± 9.6 %
		Y	5.73	66.92	16.20		150.0	
		Z	5.53	66.96	16.15		150.0	
10562-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	5.70	66.99	16.38	0.00	150.0	± 9.6 %
		Y	5.78	67.08	16.28		150.0	
		Z	5.57	67.08	16.21		150.0	
10563-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	5.83	67.06	16.38	0.00	150.0	± 9.6 %
		Y	5.88	67.05	16.23		150.0	
		Z	5.69	67.13	16.21		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.54	66.89	16.37	0.46	150.0	± 9.6 %
		Y	4.63	66.82	16.23		150.0	
		Z	4.43	67.15	16.24		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	4.73	67.33	16.71	0.46	150.0	± 9.6 %
		Y	4.83	67.24	16.56		150.0	
		Z	4.62	67.61	16.60		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.57	67.12	16.50	0.46	150.0	± 9.6 %
		Y	4.67	67.04	16.35		150.0	
		Z	4.45	67.36	16.36		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.61	67.61	16.94	0.46	150.0	± 9.6 %
		Y	4.71	67.49	16.76		150.0	
		Z	4.52	67.92	16.85		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.44	66.77	16.18	0.46	150.0	± 9.6 %
		Y	4.56	66.75	16.07		150.0	
		Z	4.30	66.87	15.96		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.62	67.93	17.13	0.46	150.0	± 9.6 %
		Y	4.70	67.74	16.91		150.0	
		Z	4.54	68.30	17.08		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.60	67.62	16.96	0.46	150.0	± 9.6 %
		Y	4.69	67.48	16.77		150.0	
		Z	4.49	67.91	16.87		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.06	65.12	15.94	0.46	130.0	± 9.6 %
		Y	1.10	64.13	15.18		130.0	
		Z	1.03	64.76	15.54		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.08	65.91	16.43	0.46	130.0	± 9.6 %
		Y	1.12	64.69	15.54		130.0	
		Z	1.04	65.49	16.01		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	148.16	38.24	0.46	130.0	± 9.6 %
		Y	1.56	82.04	21.65		130.0	
		Z	5.25	106.01	29.47		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.42	75.83	21.21	0.46	130.0	± 9.6 %
		Y	1.20	70.29	18.45		130.0	
		Z	1.26	74.01	20.40		130.0	

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.33	66.73	16.43	0.46	130.0	± 9.6 %
		Y	4.42	66.59	16.25		130.0	
		Z	4.21	66.91	16.24		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.37	66.97	16.54	0.46	130.0	± 9.6 %
		Y	4.45	66.81	16.35		130.0	
		Z	4.25	67.19	16.37		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.52	67.20	16.69	0.46	130.0	± 9.6 %
		Y	4.61	67.05	16.50		130.0	
		Z	4.39	67.40	16.51		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.44	67.39	16.83	0.46	130.0	± 9.6 %
		Y	4.52	67.21	16.62		130.0	
		Z	4.32	67.63	16.68		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.17	66.41	15.97	0.46	130.0	± 9.6 %
		Y	4.27	66.33	15.82		130.0	
		Z	4.03	66.48	15.71		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.20	66.45	15.97	0.46	130.0	± 9.6 %
		Y	4.30	66.37	15.83		130.0	
		Z	4.03	66.43	15.66		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.36	67.52	16.83	0.46	130.0	± 9.6 %
		Y	4.43	67.28	16.58		130.0	
		Z	4.25	67.77	16.69		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.09	66.15	15.71	0.46	130.0	± 9.6 %
		Y	4.19	66.07	15.58		130.0	
		Z	3.93	66.16	15.43		130.0	
10583-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.33	66.73	16.43	0.46	130.0	± 9.6 %
		Y	4.42	66.59	16.25		130.0	
		Z	4.21	66.91	16.24		130.0	
10584-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.37	66.97	16.54	0.46	130.0	± 9.6 %
		Y	4.45	66.81	16.35		130.0	
		Z	4.25	67.19	16.37		130.0	
10585-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.52	67.20	16.69	0.46	130.0	± 9.6 %
		Y	4.61	67.05	16.50		130.0	
		Z	4.39	67.40	16.51		130.0	
10586-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.44	67.39	16.83	0.46	130.0	± 9.6 %
		Y	4.52	67.21	16.62		130.0	
		Z	4.32	67.63	16.68		130.0	
10587-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.17	66.41	15.97	0.46	130.0	± 9.6 %
		Y	4.27	66.33	15.82		130.0	
		Z	4.03	66.48	15.71		130.0	
10588-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.20	66.45	15.97	0.46	130.0	± 9.6 %
		Y	4.30	66.37	15.83		130.0	
		Z	4.03	66.43	15.66		130.0	
10589-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.36	67.52	16.83	0.46	130.0	± 9.6 %
		Y	4.43	67.28	16.58		130.0	
		Z	4.25	67.77	16.69		130.0	
10590-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.09	66.15	15.71	0.46	130.0	± 9.6 %
		Y	4.19	66.07	15.58		130.0	
		Z	3.93	66.16	15.43		130.0	

10591-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.49	66.83	16.58	0.46	130.0	± 9.6 %
		Y	4.58	66.69	16.39		130.0	
		Z	4.38	67.05	16.41		130.0	
10592-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.60	67.11	16.70	0.46	130.0	± 9.6 %
		Y	4.70	66.98	16.51		130.0	
		Z	4.47	67.30	16.52		130.0	
10593-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.52	66.97	16.54	0.46	130.0	± 9.6 %
		Y	4.61	66.85	16.36		130.0	
		Z	4.39	67.15	16.35		130.0	
10594-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.58	67.18	16.73	0.46	130.0	± 9.6 %
		Y	4.67	67.04	16.54		130.0	
		Z	4.45	67.37	16.56		130.0	
10595-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.54	67.16	16.64	0.46	130.0	± 9.6 %
		Y	4.63	67.01	16.44		130.0	
		Z	4.41	67.33	16.45		130.0	
10596-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.47	67.10	16.62	0.46	130.0	± 9.6 %
		Y	4.56	66.97	16.43		130.0	
		Z	4.33	67.23	16.41		130.0	
10597-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.42	66.95	16.45	0.46	130.0	± 9.6 %
		Y	4.51	66.83	16.28		130.0	
		Z	4.29	67.09	16.24		130.0	
10598-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.43	67.26	16.77	0.46	130.0	± 9.6 %
		Y	4.51	67.10	16.57		130.0	
		Z	4.32	67.48	16.62		130.0	
10599-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.20	67.31	16.86	0.46	130.0	± 9.6 %
		Y	5.25	67.14	16.63		130.0	
		Z	5.07	67.41	16.66		130.0	
10600-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.32	67.75	17.05	0.46	130.0	± 9.6 %
		Y	5.35	67.47	16.76		130.0	
		Z	5.09	67.50	16.68		130.0	
10601-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.22	67.51	16.96	0.46	130.0	± 9.6 %
		Y	5.25	67.27	16.68		130.0	
		Z	5.07	67.56	16.73		130.0	
10602-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.29	67.46	16.84	0.46	130.0	± 9.6 %
		Y	5.35	67.29	16.61		130.0	
		Z	5.08	67.29	16.50		130.0	
10603-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.35	67.74	17.13	0.46	130.0	± 9.6 %
		Y	5.42	67.61	16.91		130.0	
		Z	5.13	67.56	16.79		130.0	
10604-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.20	67.21	16.84	0.46	130.0	± 9.6 %
		Y	5.30	67.25	16.71		130.0	
		Z	5.02	67.15	16.55		130.0	
10605-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.28	67.48	16.97	0.46	130.0	± 9.6 %
		Y	5.34	67.34	16.74		130.0	
		Z	5.07	67.33	16.64		130.0	
10606-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.08	66.97	16.56	0.46	130.0	± 9.6 %
		Y	5.12	66.78	16.32		130.0	
		Z	4.92	66.93	16.28		130.0	

10607-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.35	66.22	16.25	0.46	130.0	± 9.6 %
		Y	4.42	66.04	16.04		130.0	
		Z	4.24	66.46	16.10		130.0	
10608-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.48	66.53	16.39	0.46	130.0	± 9.6 %
		Y	4.56	66.36	16.18		130.0	
		Z	4.35	66.73	16.22		130.0	
10609-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.38	66.34	16.19	0.46	130.0	± 9.6 %
		Y	4.46	66.19	15.99		130.0	
		Z	4.25	66.53	16.02		130.0	
10610-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.43	66.55	16.39	0.46	130.0	± 9.6 %
		Y	4.51	66.37	16.17		130.0	
		Z	4.31	66.77	16.23		130.0	
10611-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.34	66.31	16.21	0.46	130.0	± 9.6 %
		Y	4.42	66.16	16.01		130.0	
		Z	4.21	66.50	16.03		130.0	
10612-AAA	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.32	66.43	16.24	0.46	130.0	± 9.6 %
		Y	4.41	66.27	16.04		130.0	
		Z	4.18	66.54	16.03		130.0	
10613-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.31	66.21	16.06	0.46	130.0	± 9.6 %
		Y	4.40	66.08	15.88		130.0	
		Z	4.17	66.33	15.85		130.0	
10614-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.30	66.52	16.37	0.46	130.0	± 9.6 %
		Y	4.38	66.35	16.16		130.0	
		Z	4.18	66.74	16.22		130.0	
10615-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.32	66.10	15.94	0.46	130.0	± 9.6 %
		Y	4.41	65.96	15.76		130.0	
		Z	4.18	66.24	15.73		130.0	
10616-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	4.99	66.43	16.42	0.46	130.0	± 9.6 %
		Y	5.06	66.34	16.22		130.0	
		Z	4.86	66.54	16.23		130.0	
10617-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.03	66.54	16.45	0.46	130.0	± 9.6 %
		Y	5.10	66.46	16.25		130.0	
		Z	4.87	66.58	16.22		130.0	
10618-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	4.94	66.60	16.49	0.46	130.0	± 9.6 %
		Y	5.02	66.54	16.31		130.0	
		Z	4.80	66.71	16.31		130.0	
10619-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	4.99	66.52	16.38	0.46	130.0	± 9.6 %
		Y	5.03	66.34	16.14		130.0	
		Z	4.83	66.55	16.15		130.0	
10620-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.03	66.43	16.38	0.46	130.0	± 9.6 %
		Y	5.10	66.34	16.19		130.0	
		Z	4.87	66.44	16.14		130.0	
10621-AAA	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.04	66.55	16.58	0.46	130.0	± 9.6 %
		Y	5.11	66.48	16.39		130.0	
		Z	4.92	66.71	16.42		130.0	
10622-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.03	66.66	16.63	0.46	130.0	± 9.6 %
		Y	5.10	66.57	16.42		130.0	
		Z	4.89	66.76	16.44		130.0	

10623-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	4.92	66.17	16.23	0.46	130.0	± 9.6 %
		Y	4.99	66.10	16.04		130.0	
		Z	4.79	66.29	16.04		130.0	
10624-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.11	66.45	16.44	0.46	130.0	± 9.6 %
		Y	5.19	66.37	16.25		130.0	
		Z	4.97	66.53	16.23		130.0	
10625-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.22	66.67	16.62	0.46	130.0	± 9.6 %
		Y	5.28	66.51	16.38		130.0	
		Z	5.06	66.71	16.39		130.0	
10626-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.33	66.38	16.34	0.46	130.0	± 9.6 %
		Y	5.39	66.36	16.17		130.0	
		Z	5.21	66.49	16.15		130.0	
10627-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.59	67.13	16.68	0.46	130.0	± 9.6 %
		Y	5.61	66.95	16.43		130.0	
		Z	5.40	67.02	16.39		130.0	
10628-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.32	66.34	16.21	0.46	130.0	± 9.6 %
		Y	5.38	66.33	16.05		130.0	
		Z	5.18	66.39	16.00		130.0	
10629-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.47	66.71	16.39	0.46	130.0	± 9.6 %
		Y	5.48	66.50	16.13		130.0	
		Z	5.31	66.69	16.14		130.0	
10630-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	5.68	67.55	16.82	0.46	130.0	± 9.6 %
		Y	5.71	67.40	16.59		130.0	
		Z	5.39	67.16	16.39		130.0	
10631-AAA	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	5.64	67.57	17.04	0.46	130.0	± 9.6 %
		Y	5.70	67.49	16.83		130.0	
		Z	5.46	67.53	16.79		130.0	
10632-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.63	67.44	16.99	0.46	130.0	± 9.6 %
		Y	5.62	67.15	16.68		130.0	
		Z	5.46	67.43	16.75		130.0	
10633-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.33	66.40	16.29	0.46	130.0	± 9.6 %
		Y	5.42	66.45	16.15		130.0	
		Z	5.20	66.49	16.10		130.0	
10634-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.37	66.64	16.46	0.46	130.0	± 9.6 %
		Y	5.44	66.63	16.29		130.0	
		Z	5.25	66.79	16.30		130.0	
10635-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.21	65.78	15.73	0.46	130.0	± 9.6 %
		Y	5.29	65.83	15.61		130.0	
		Z	5.07	65.82	15.50		130.0	
10636-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.77	66.72	16.42	0.46	130.0	± 9.6 %
		Y	5.82	66.71	16.25		130.0	
		Z	5.64	66.78	16.21		130.0	
10637-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	5.90	67.05	16.57	0.46	130.0	± 9.6 %
		Y	5.94	67.01	16.39		130.0	
		Z	5.72	66.99	16.30		130.0	
10638-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	5.93	67.14	16.59	0.46	130.0	± 9.6 %
		Y	5.96	67.07	16.40		130.0	
		Z	5.77	67.13	16.35		130.0	

10639-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	5.87	66.96	16.54	0.46	130.0	± 9.6 %
		Y	5.92	66.95	16.38		130.0	
		Z	5.72	67.01	16.33		130.0	
10640-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	5.80	66.76	16.38	0.46	130.0	± 9.6 %
		Y	5.88	66.84	16.27		130.0	
		Z	5.64	66.74	16.13		130.0	
10641-AAB	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	5.94	66.98	16.51	0.46	130.0	± 9.6 %
		Y	5.97	66.91	16.32		130.0	
		Z	5.75	66.87	16.22		130.0	
10642-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	5.94	67.12	16.76	0.46	130.0	± 9.6 %
		Y	6.00	67.14	16.61		130.0	
		Z	5.80	67.17	16.56		130.0	
10643-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	5.79	66.79	16.48	0.46	130.0	± 9.6 %
		Y	5.85	66.80	16.33		130.0	
		Z	5.62	66.75	16.21		130.0	
10644-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	5.83	66.94	16.57	0.46	130.0	± 9.6 %
		Y	5.90	67.00	16.44		130.0	
		Z	5.67	66.93	16.32		130.0	
10645-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	5.99	67.10	16.62	0.46	130.0	± 9.6 %
		Y	6.03	67.04	16.43		130.0	
		Z	5.79	66.98	16.32		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	10.99	100.29	34.81	9.30	60.0	± 9.6 %
		Y	9.88	96.69	33.11		60.0	
		Z	5.76	86.83	29.52		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	9.57	97.81	34.14	9.30	60.0	± 9.6 %
		Y	8.70	94.40	32.46		60.0	
		Z	5.05	84.45	28.75		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.33	60.00	5.57	0.00	150.0	± 9.6 %
		Y	0.47	61.19	7.86		150.0	
		Z	0.30	60.00	5.23		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.46	67.89	16.64	2.23	80.0	± 9.6 %
		Y	3.39	66.82	16.12		80.0	
		Z	3.15	67.36	16.00		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	3.92	66.65	16.80	2.23	80.0	± 9.6 %
		Y	3.92	66.10	16.41		80.0	
		Z	3.65	66.30	16.32		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	3.93	66.16	16.82	2.23	80.0	± 9.6 %
		Y	3.94	65.72	16.45		80.0	
		Z	3.68	65.81	16.36		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.00	66.00	16.84	2.23	80.0	± 9.6 %
		Y	4.01	65.63	16.48		80.0	
		Z	3.76	65.63	16.38		80.0	

[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Appendix E – Dipole Calibration Data Sheets

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

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Accreditation No.: SCS 0108

Client RF Exposure Lab

Certificate No: D750V3-1016_Jul18

CALIBRATION CERTIFICATE

Object: D750V3 - SN:1016

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 13, 2018

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 16, 2018

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

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Accreditation No.: SCS 0108

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.89 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	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.23 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.38 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.55 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.64 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	53.4 Ω + 0.0 jΩ
Return Loss	- 29.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.8 Ω - 2.6 jΩ
Return Loss	- 30.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.038 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
Manufactured on	March 22, 2010

DASY5 Validation Report for Head TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1016

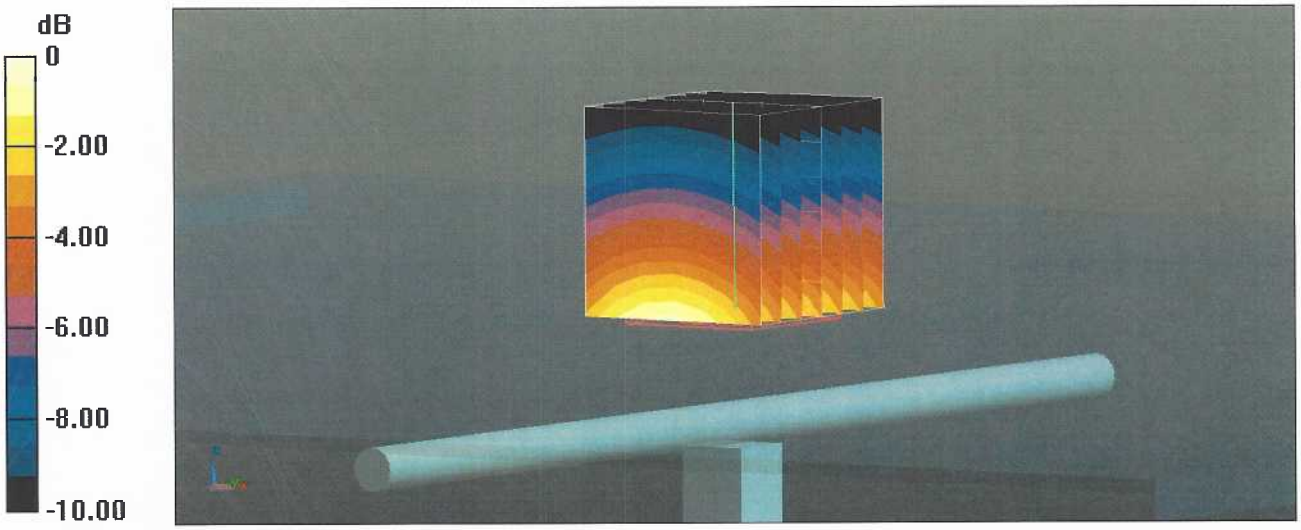
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

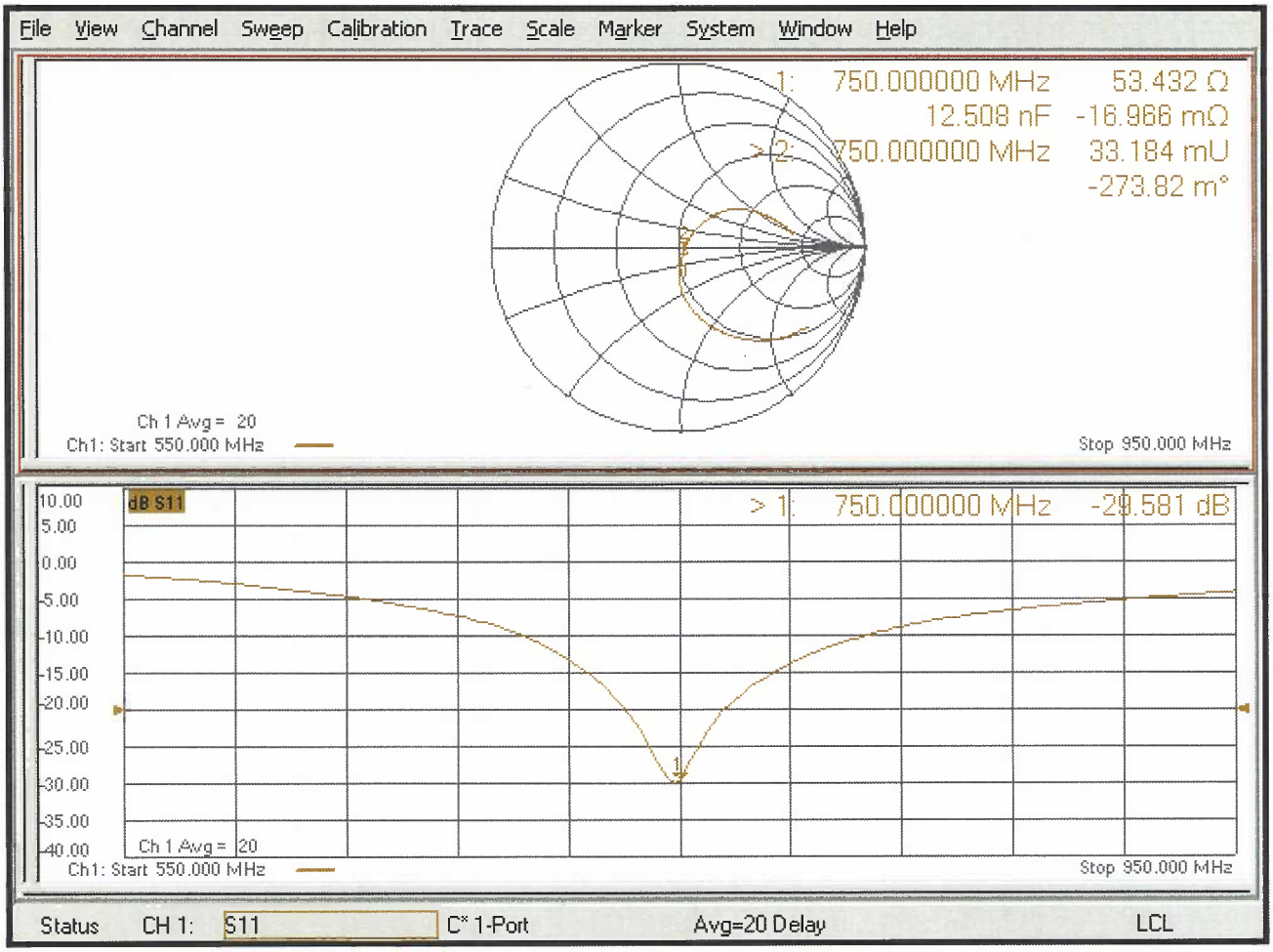
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.03 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.10 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.76 W/kg



0 dB = 2.76 W/kg = 4.41 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1016

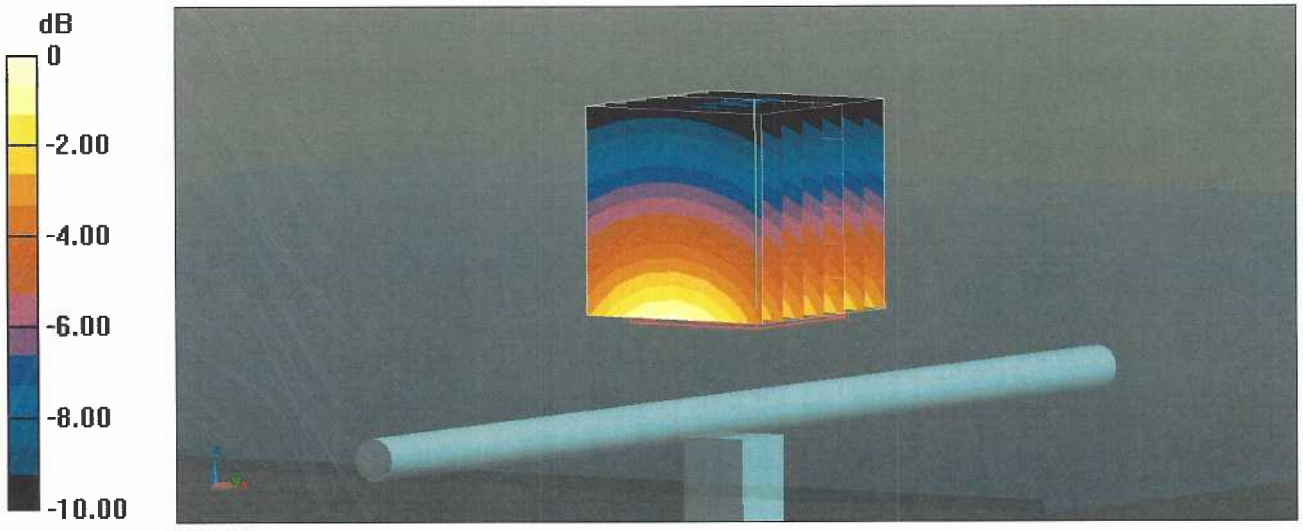
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

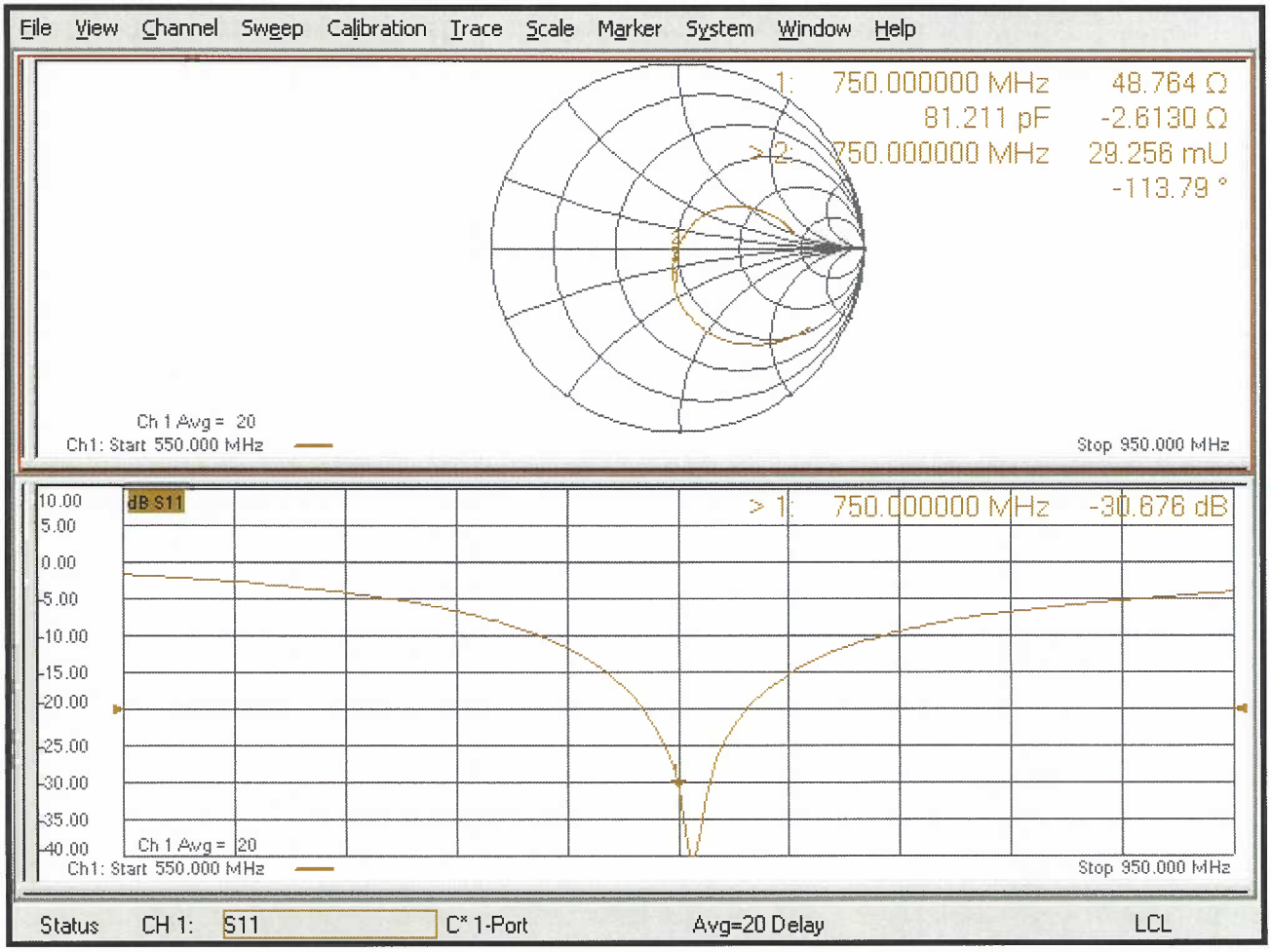
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.68 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.84 W/kg



0 dB = 2.84 W/kg = 4.53 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **RF Exposure Lab**

Certificate No: D750V3-1053_Aug15

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1053
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	August 10, 2015

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 EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 12, 2015

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

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Swiss Calibration Service

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

Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.1 ± 6 %	0.91 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	2.04 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.03 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.25 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.3 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.48 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.59 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	54.4 Ω - 0.4 jΩ
Return Loss	- 27.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.5 Ω - 2.5 jΩ
Return Loss	- 32.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 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
Manufactured on	November 08, 2011

Extended Calibration

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB Publication 865664 D01 v01r04.

D750V3 SN: 1053 - Head						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/10/2015	-27.5		54.4		-0.4	
8/9/2016	-25.9	-5.8	54.3	-0.1	-0.5	-0.1
8/10/2017	-26.9	-2.2	54.1	-0.3	-0.3	0.1

D750V3 SN: 1053 - Body						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/10/2015	-32.0		49.5		-2.5	
8/9/2016	-31.5	-1.6	51.0	1.5	-2.9	-0.4
8/10/2017	-31.2	-2.5	50.3	0.8	-2.8	-0.3

DASY5 Validation Report for Head TSL

Date: 10.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1053

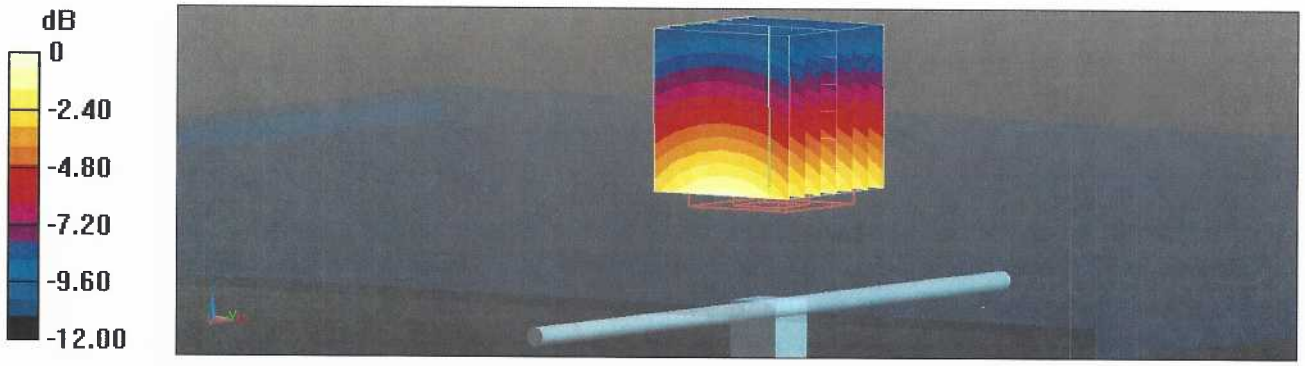
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.44, 6.44, 6.44); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

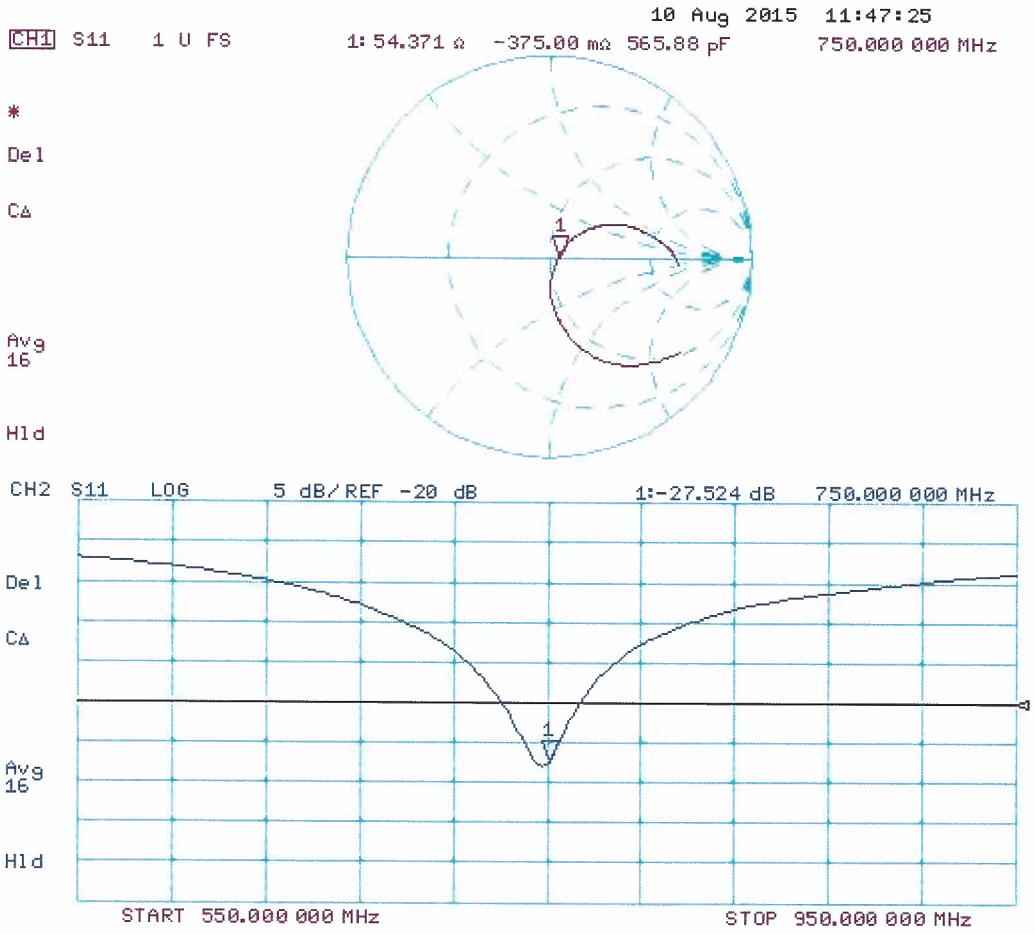
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.03 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 2.04 W/kg; SAR(10 g) = 1.33 W/kg
Maximum value of SAR (measured) = 2.39 W/kg



0 dB = 2.39 W/kg = 3.78 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 10.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1053

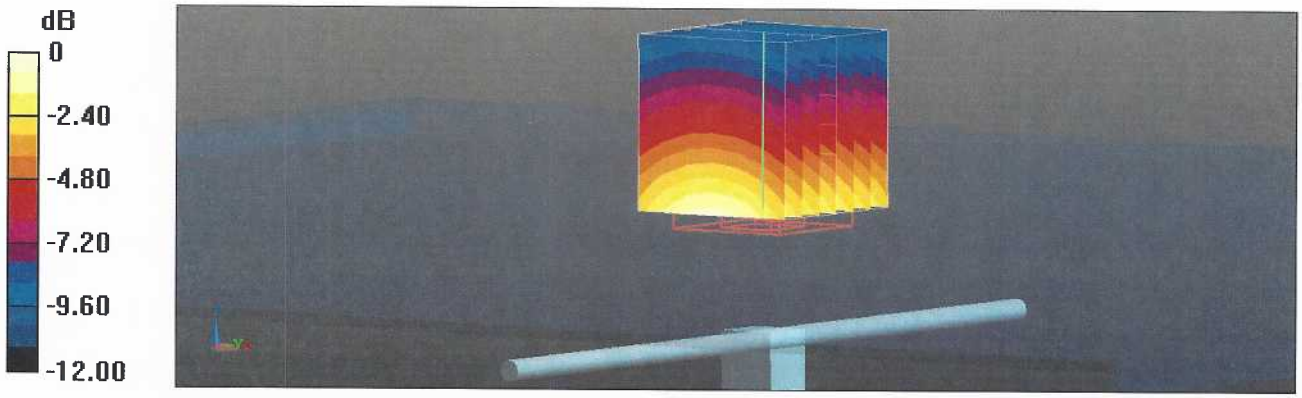
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 1 S/m; ε_r = 56.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.21, 6.21, 6.21); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

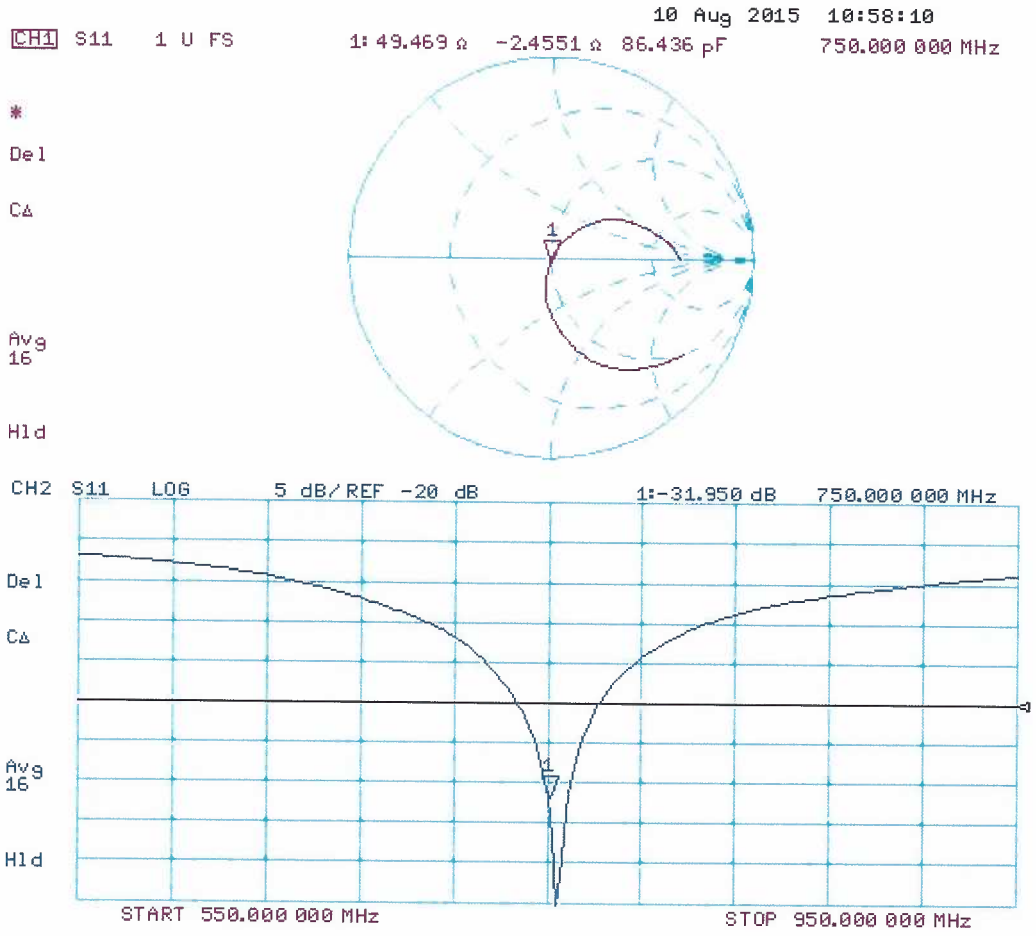
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.22 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.19 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (measured) = 2.55 W/kg



0 dB = 2.55 W/kg = 4.07 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client RF Exposure Lab

Certificate No: D835V2-4d089_Jul18

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d089

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 13, 2018

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 17, 2018

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Accreditation No.: SCS 0108

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	0.92 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	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.44 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.57 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.24 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	51.6 Ω - 3.3 jΩ
Return Loss	- 28.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω - 5.3 jΩ
Return Loss	- 24.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 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
Manufactured on	October 17, 2008

DASY5 Validation Report for Head TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d089

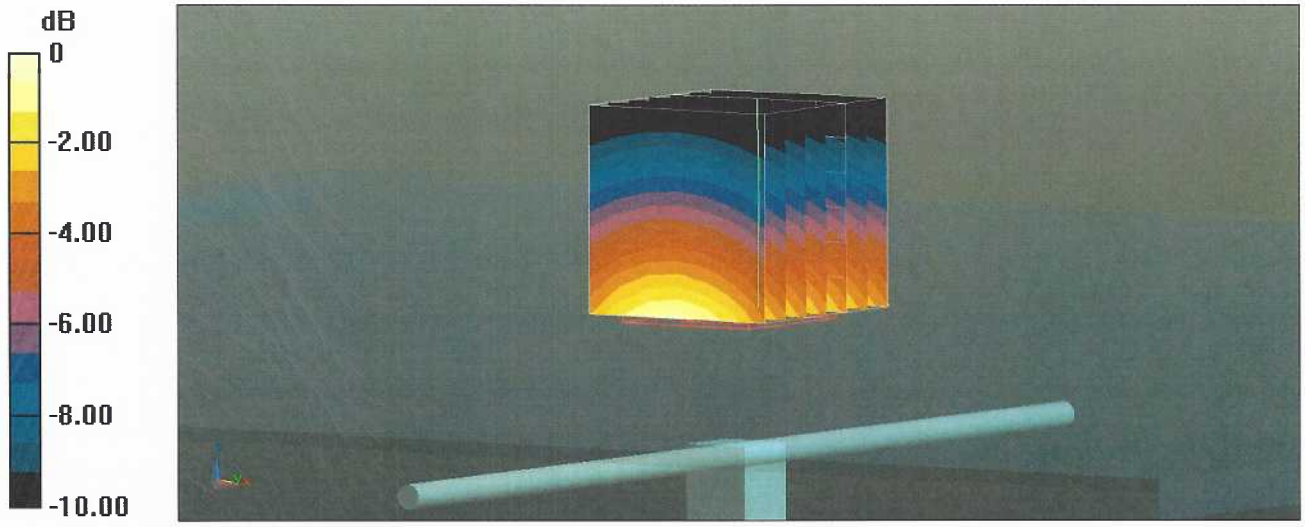
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

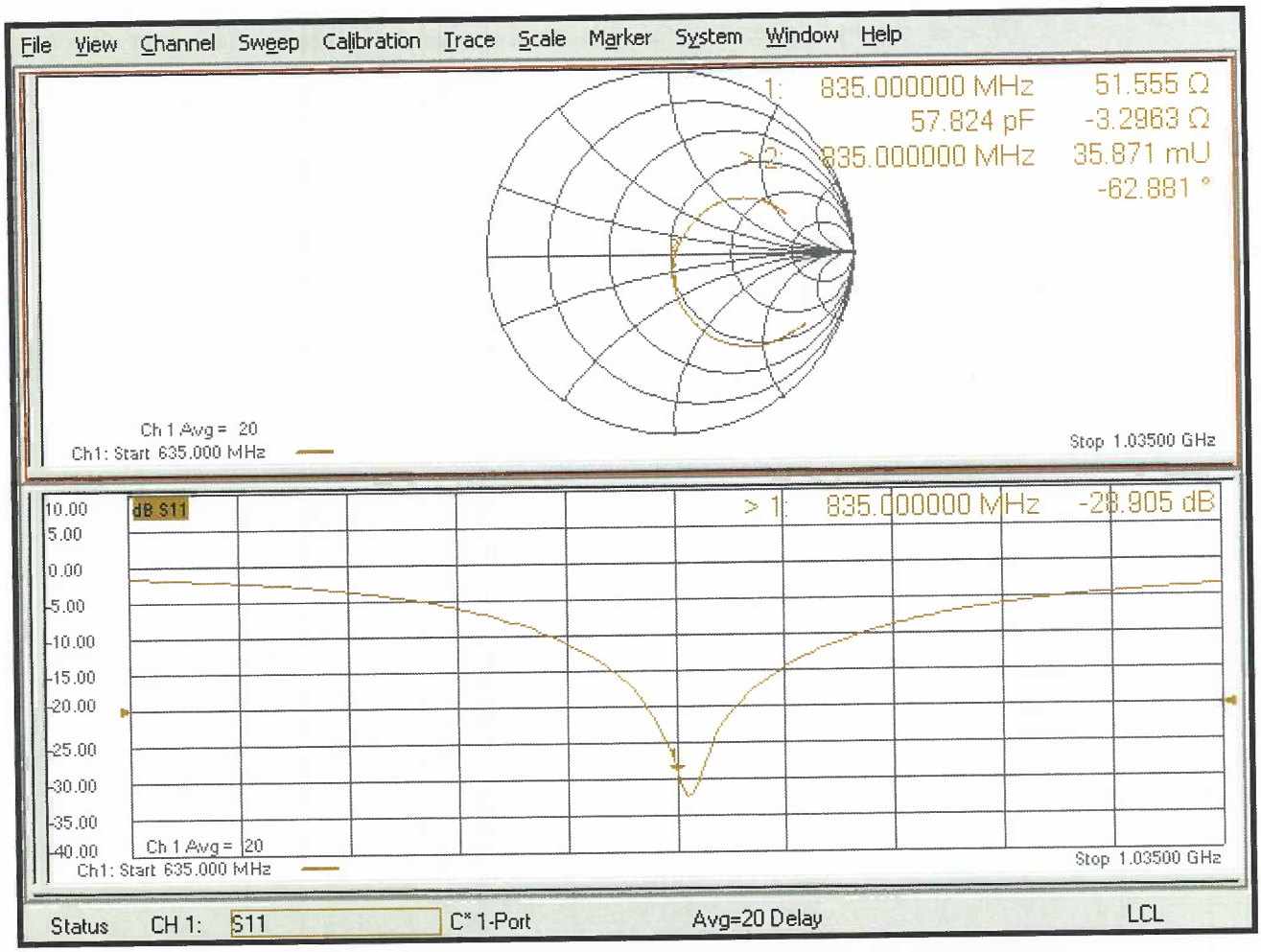
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.80 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.70 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.26 W/kg = 5.13 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d089

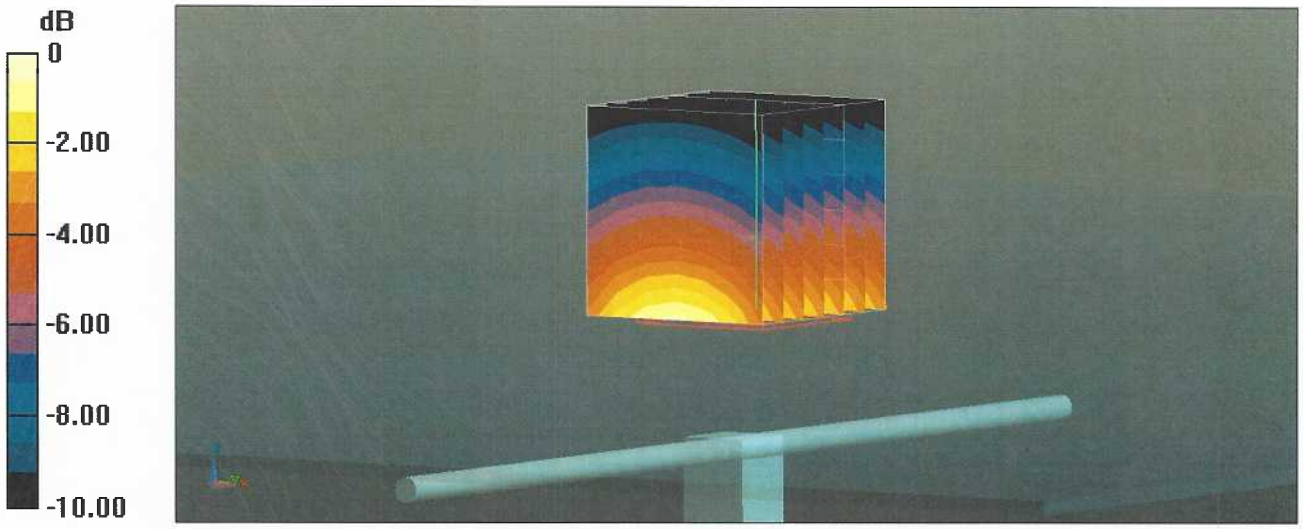
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

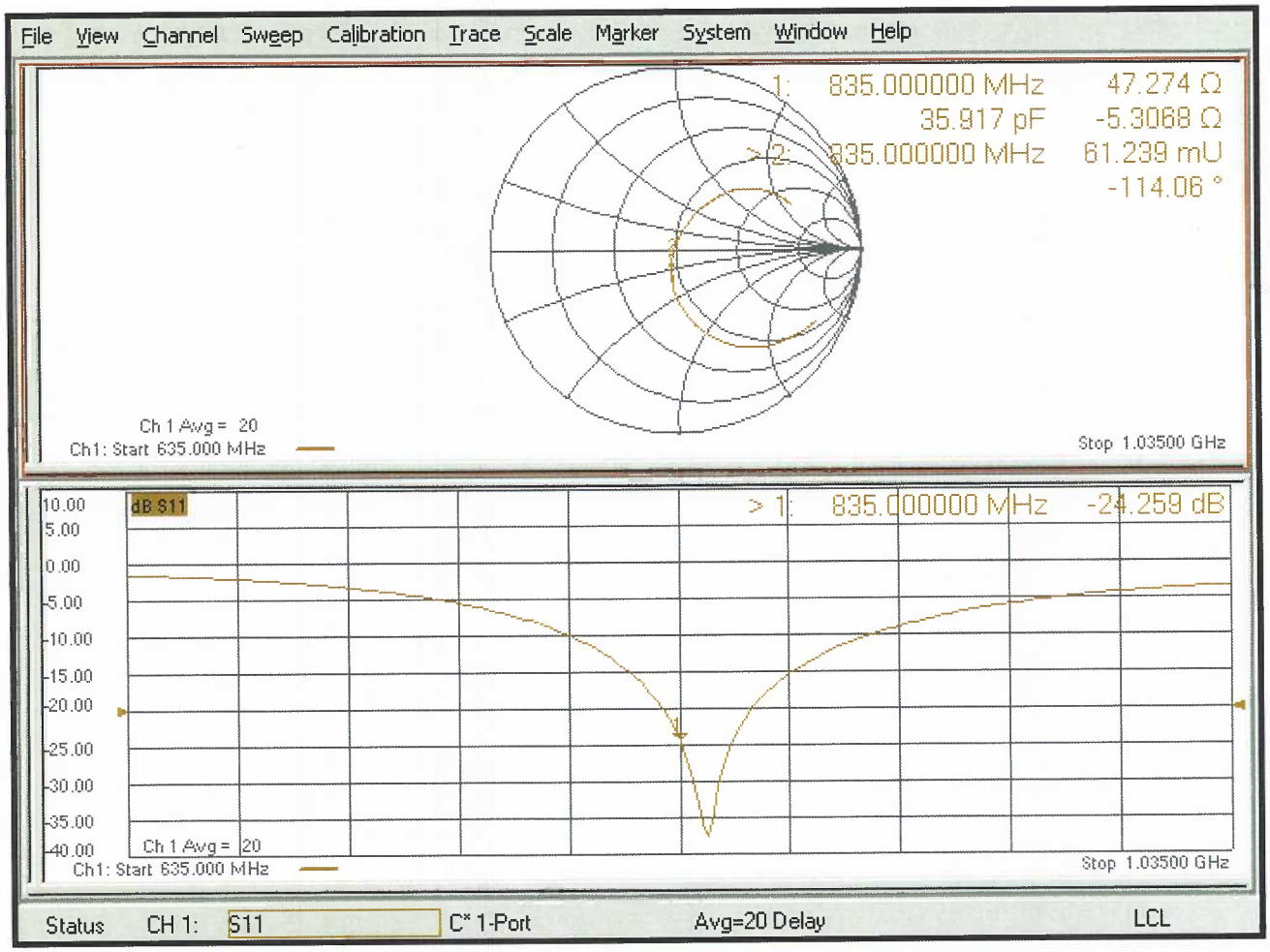
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.59 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.22 W/kg



0 dB = 3.22 W/kg = 5.08 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **RF Exposure Lab**

Certificate No: D835V2-4d131_Aug15

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d131
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	August 10, 2015

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 EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 12, 2015

Calibration Laboratory of
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Accreditation No.: SCS 0108

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.9 ± 6 %	0.93 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	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.23 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.01 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.1 ± 6 %	1.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.40 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.28 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.11 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	52.3 Ω - 1.6 jΩ
Return Loss	- 31.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω - 3.8 jΩ
Return Loss	- 26.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.394 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
Manufactured on	July 22, 2011

Extended Calibration

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB Publication 865664 D01 v01r04.

D835V2 SN: 4d131 - Head						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/10/2015	-31.2		52.3		-1.6	
8/9/2016	-29.2	-6.4	51.3	-1.0	-1.8	-0.2
8/10/2017	-30.4	-2.6	50.6	-1.7	-1.5	0.1

D835V2 SN: 4d131 - Body						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/10/2015	-26.8		47.7		-3.8	
8/9/2016	-28.5	6.3	51.2	3.5	-3.8	0.0
8/10/2017	-27.6	3.0	48.4	0.7	-3.6	0.2

DASY5 Validation Report for Head TSL

Date: 10.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d131

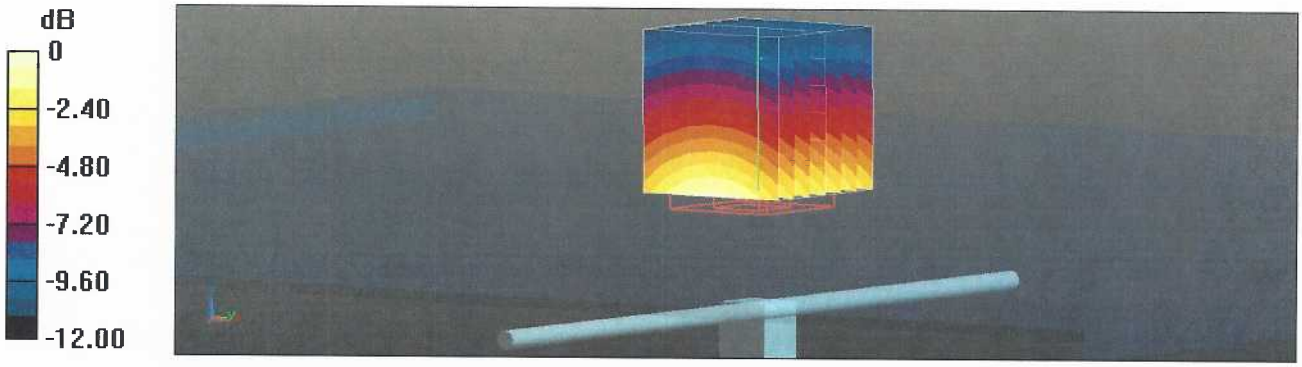
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.93 S/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.2, 6.2, 6.2); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

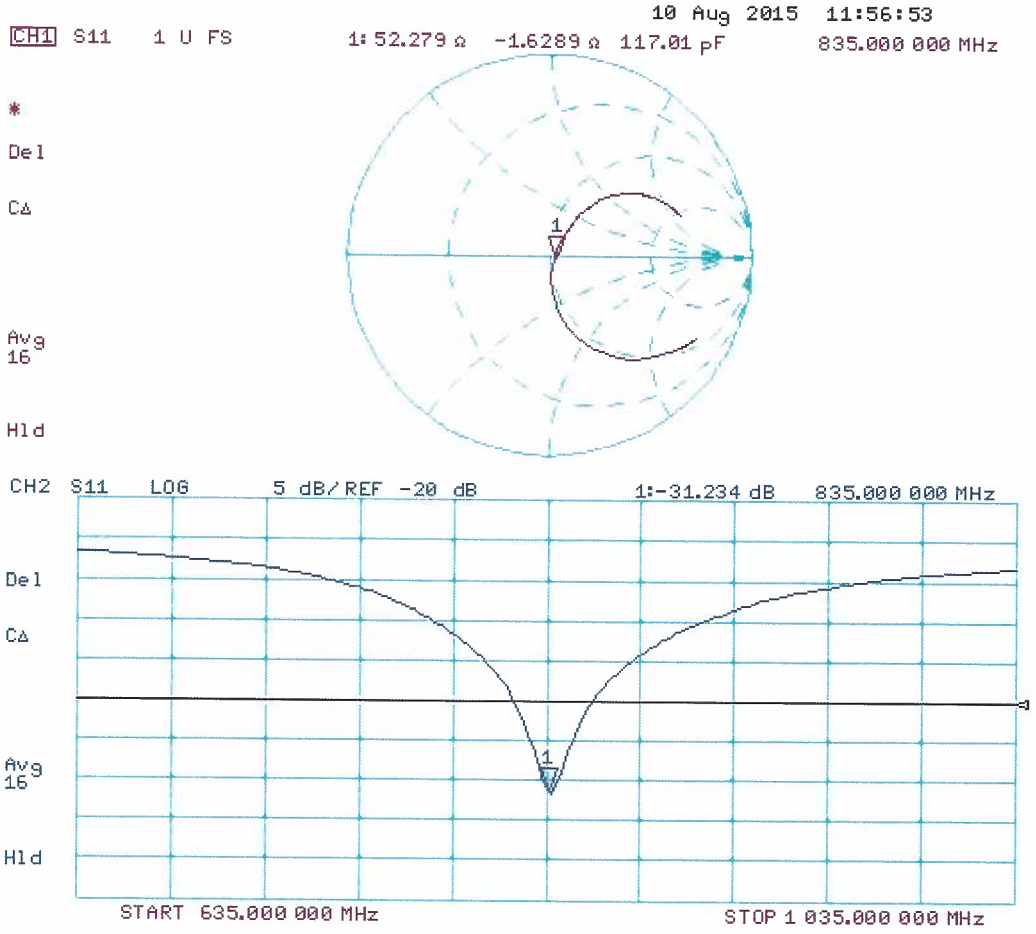
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.25 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 2.77 W/kg



0 dB = 2.77 W/kg = 4.42 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 10.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d131

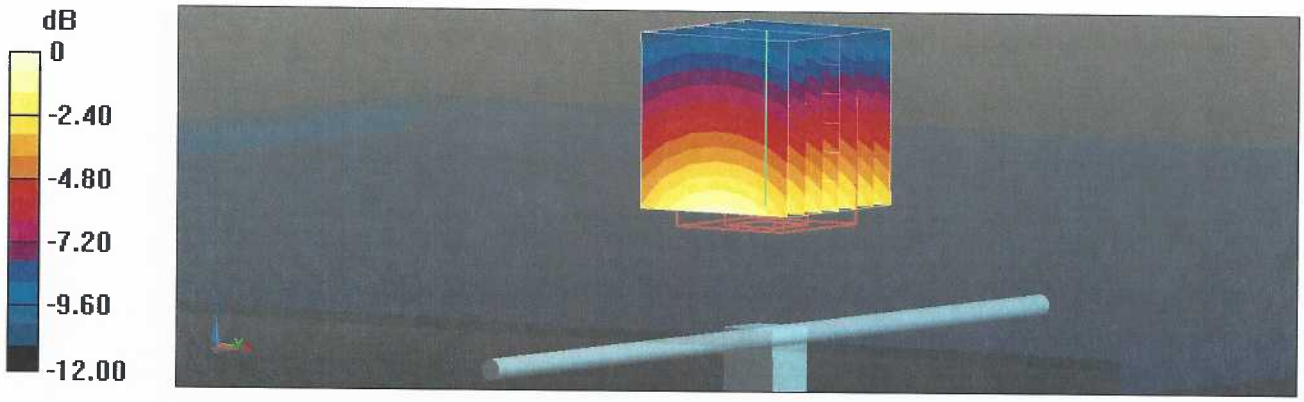
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.02 S/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.17, 6.17, 6.17); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

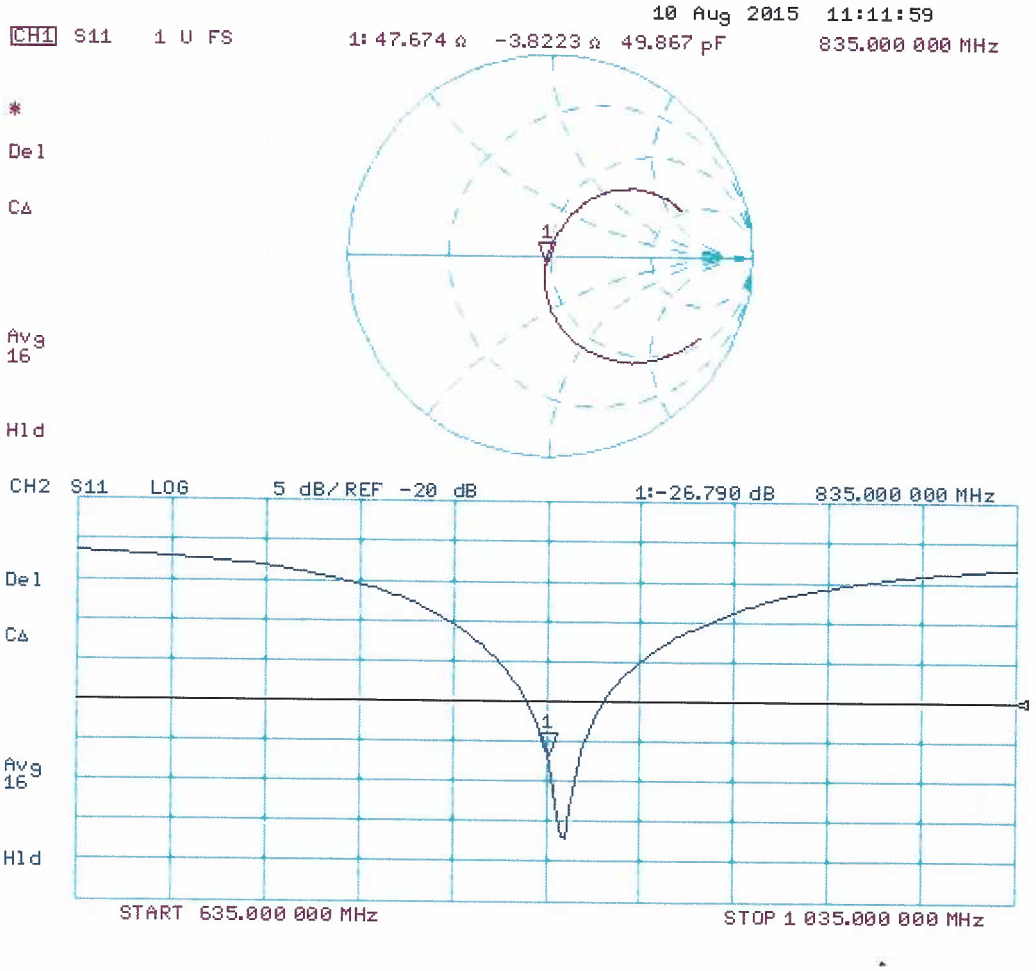
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.25 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.51 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client RF Exposure Lab

Certificate No: D1750V2-1018_Jul18

CALIBRATION CERTIFICATE

Object: D1750V2 - SN:1018

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 20, 2018

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 20, 2018

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Accreditation No.: SCS 0108

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.34 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	8.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.73 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.7 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.4 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	49.4 Ω - 1.3 jΩ
Return Loss	- 36.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.2 Ω - 0.1 jΩ
Return Loss	- 25.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.221 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
Manufactured on	February 11, 2009

DASY5 Validation Report for Head TSL

Date: 20.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1018

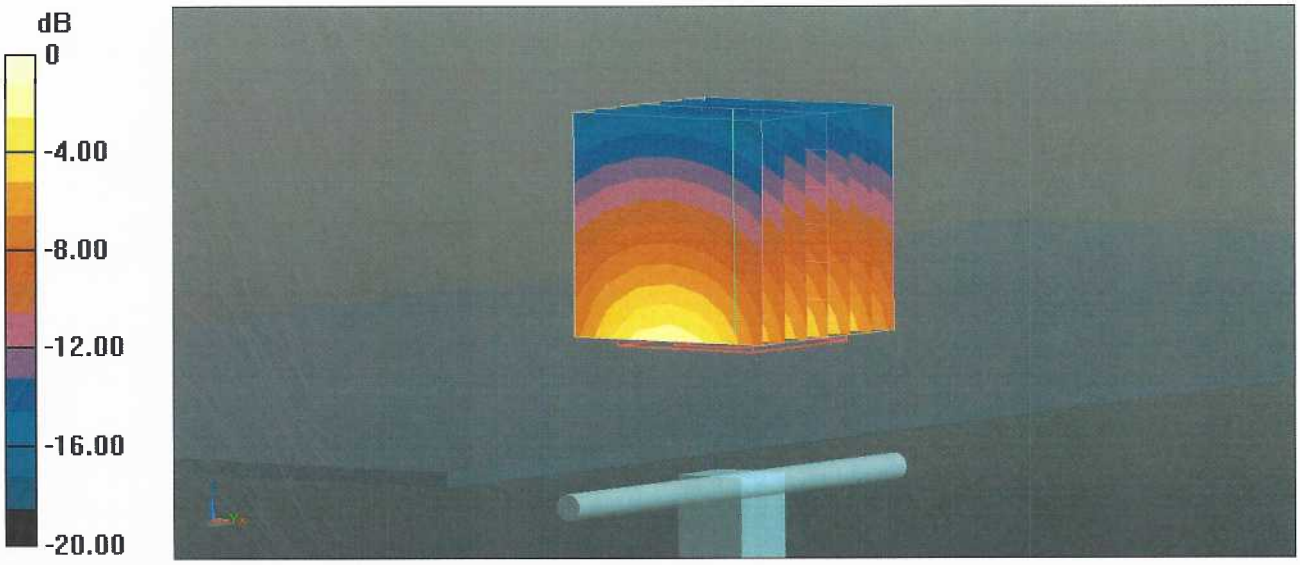
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.34 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

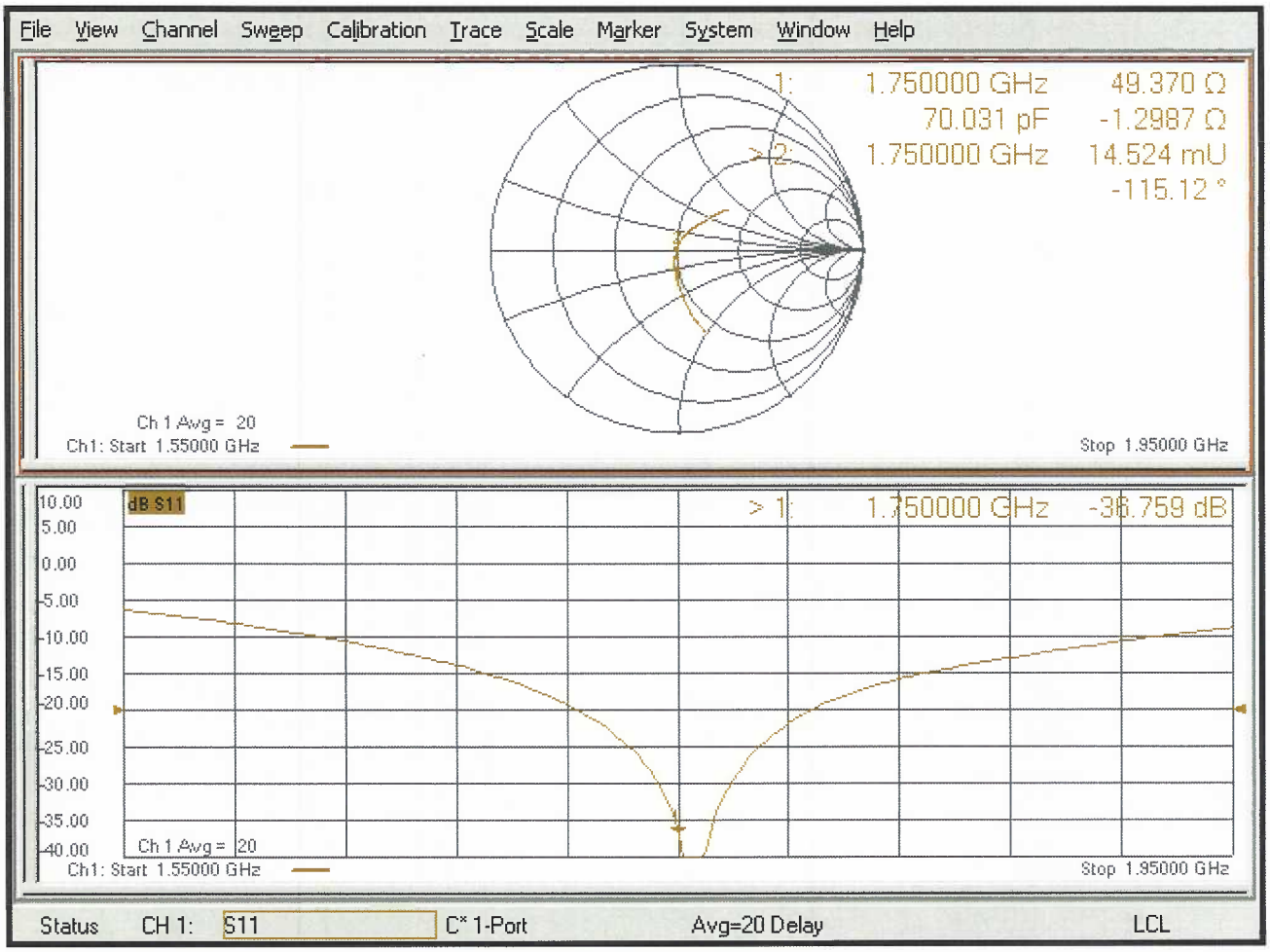
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.7 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 8.95 W/kg; SAR(10 g) = 4.73 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1018

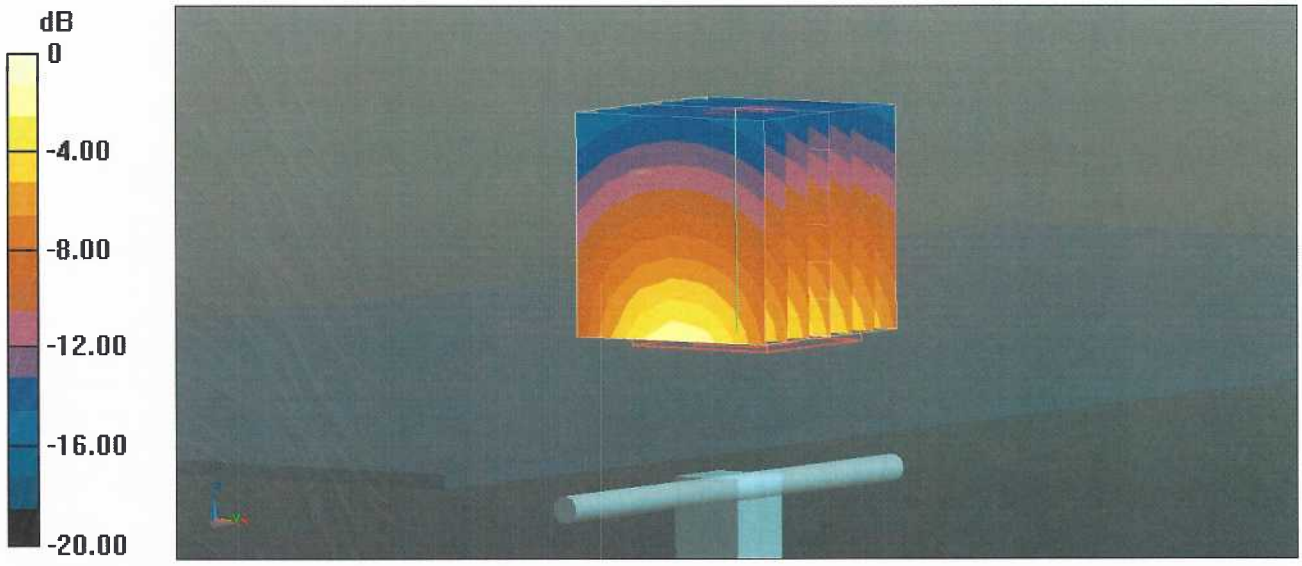
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.46 S/m; ε_r = 53.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

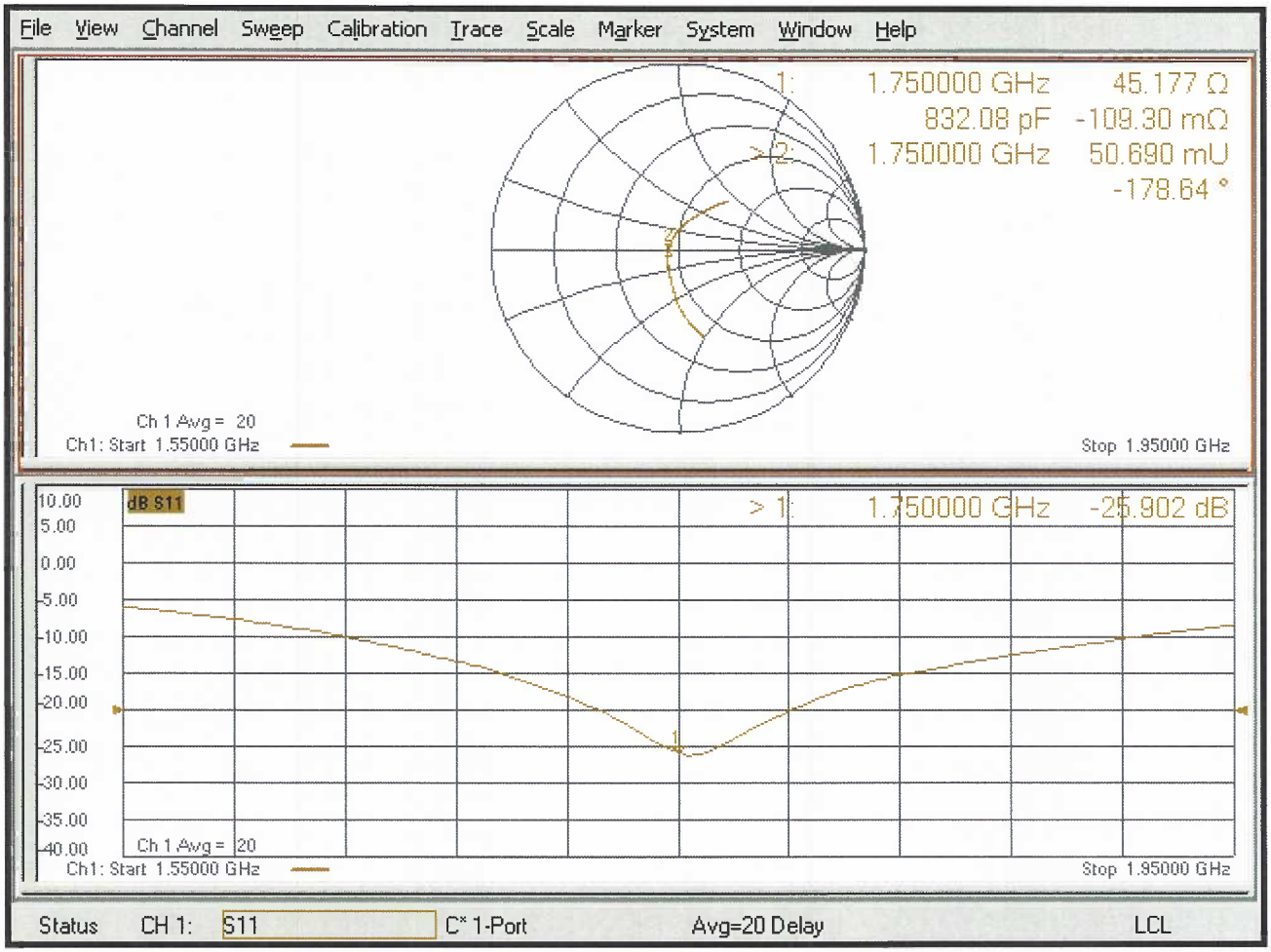
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.9 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9 W/kg; SAR(10 g) = 4.8 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg = 11.27 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **RF Exposure Lab** **Certificate No: D1750V2-1061_Aug15**

CALIBRATION CERTIFICATE

Object D1750V2 - SN:1061

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: August 13, 2015

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 EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe ES3DV3	SN: 3205	30-Dec-14 (No. ES3-3205_Dec14)	Dec-15
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 13, 2015

Calibration Laboratory of
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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

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.36 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	9.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.90 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.6 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.1 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.3 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	50.5 Ω + 1.2 jΩ
Return Loss	- 37.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω + 0.8 jΩ
Return Loss	- 30.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.220 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
Manufactured on	June 15, 2010

Extended Calibration

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB Publication 865664 D01 v01r04.

D1750V2 SN: 1061 - Head						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/13/2015	-37.8		50.5		1.2	
8/12/2016	-39.4	4.2	49.2	-1.3	0.7	-0.5
8/13/2017	-38.2	1.1	48.2	-2.3	1.1	-0.1

D1750V2 SN: 1061 - Body						
Date of Measurement	Return Loss (dB)	Δ%	Impedance Real (Ω)	ΔΩ	Impedance Imaginary (jΩ)	ΔΩ
8/13/2015	-30.7		47.3		0.8	
8/12/2016	-29.4	-4.2	46.1	-1.2	0.6	-0.2
8/13/2017	-30.1	-2.0	45.8	-1.5	0.7	-0.1

DASY5 Validation Report for Head TSL

Date: 13.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1061

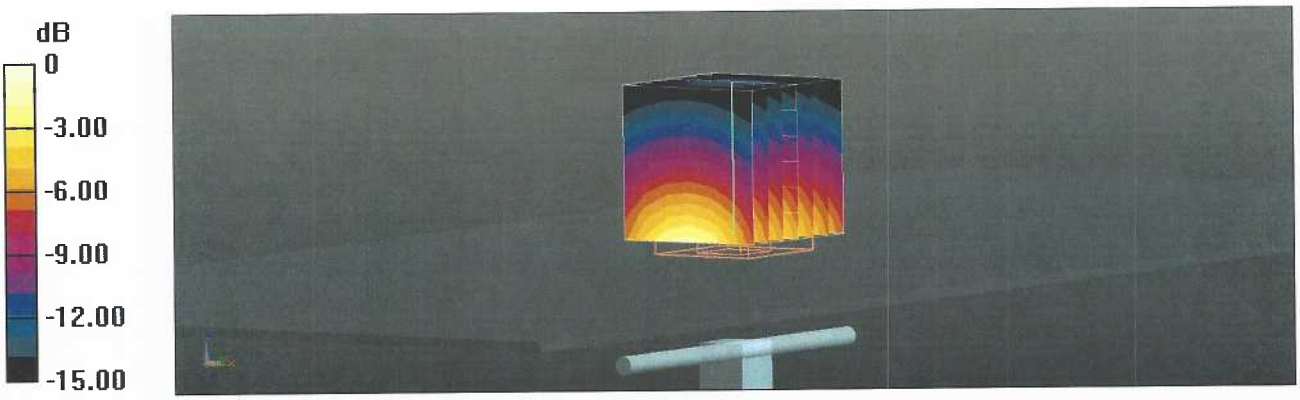
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.2, 5.2, 5.2); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

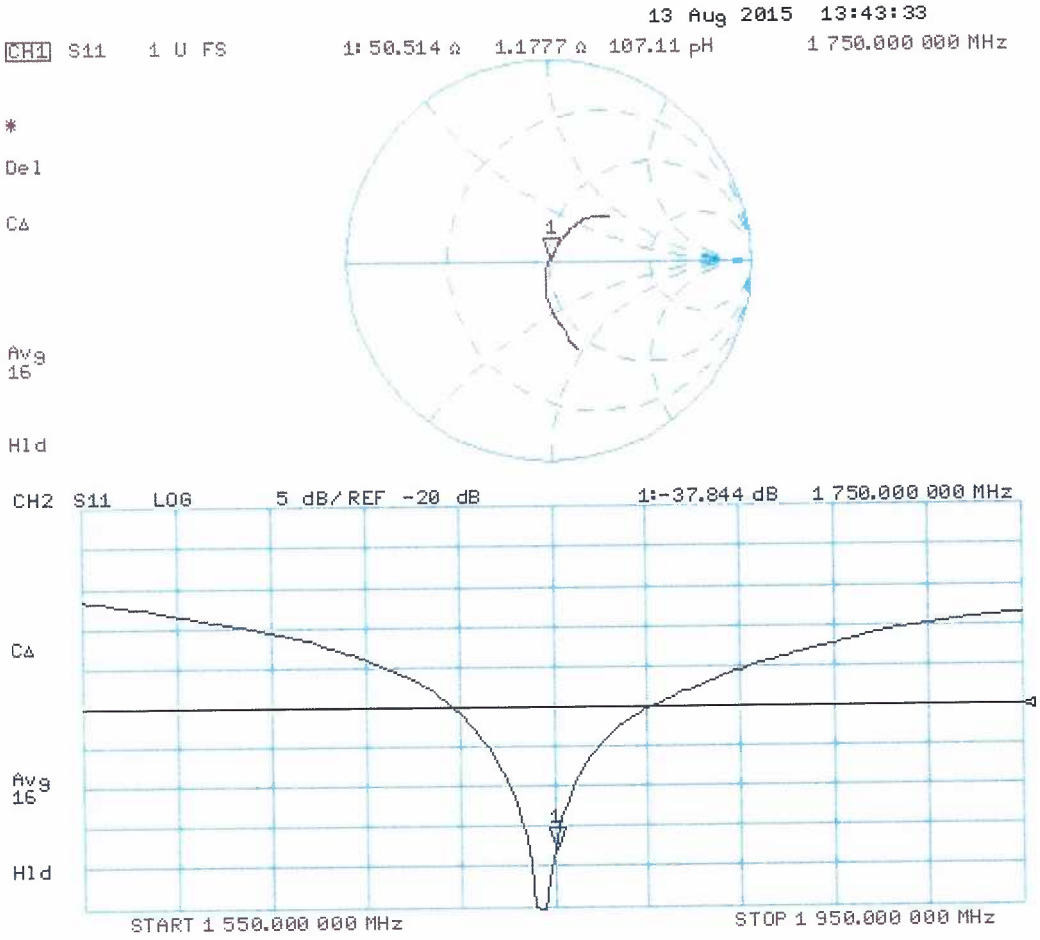
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.55 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.18 W/kg; SAR(10 g) = 4.9 W/kg
Maximum value of SAR (measured) = 11.6 W/kg



0 dB = 11.6 W/kg = 10.64 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.08.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1061

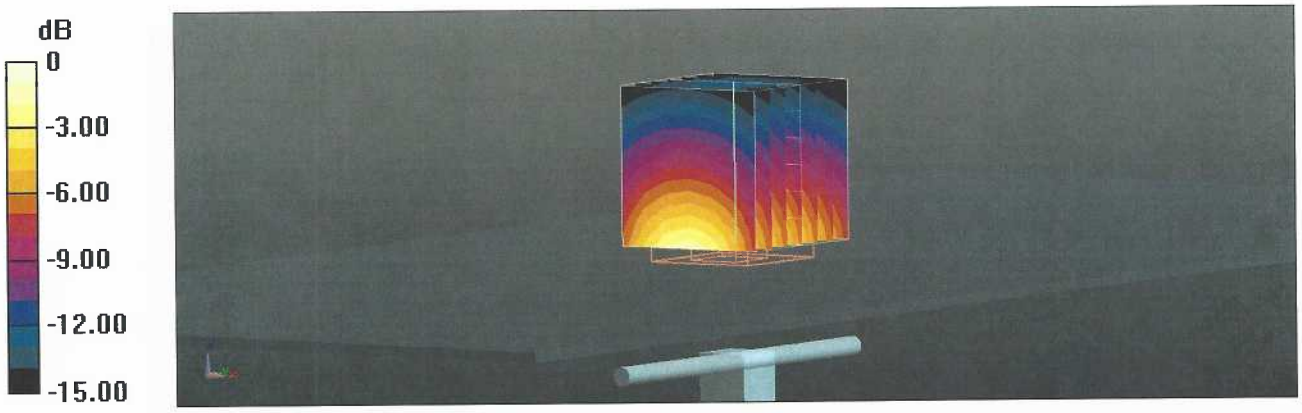
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.48 S/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.88, 4.88, 4.88); Calibrated: 30.12.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

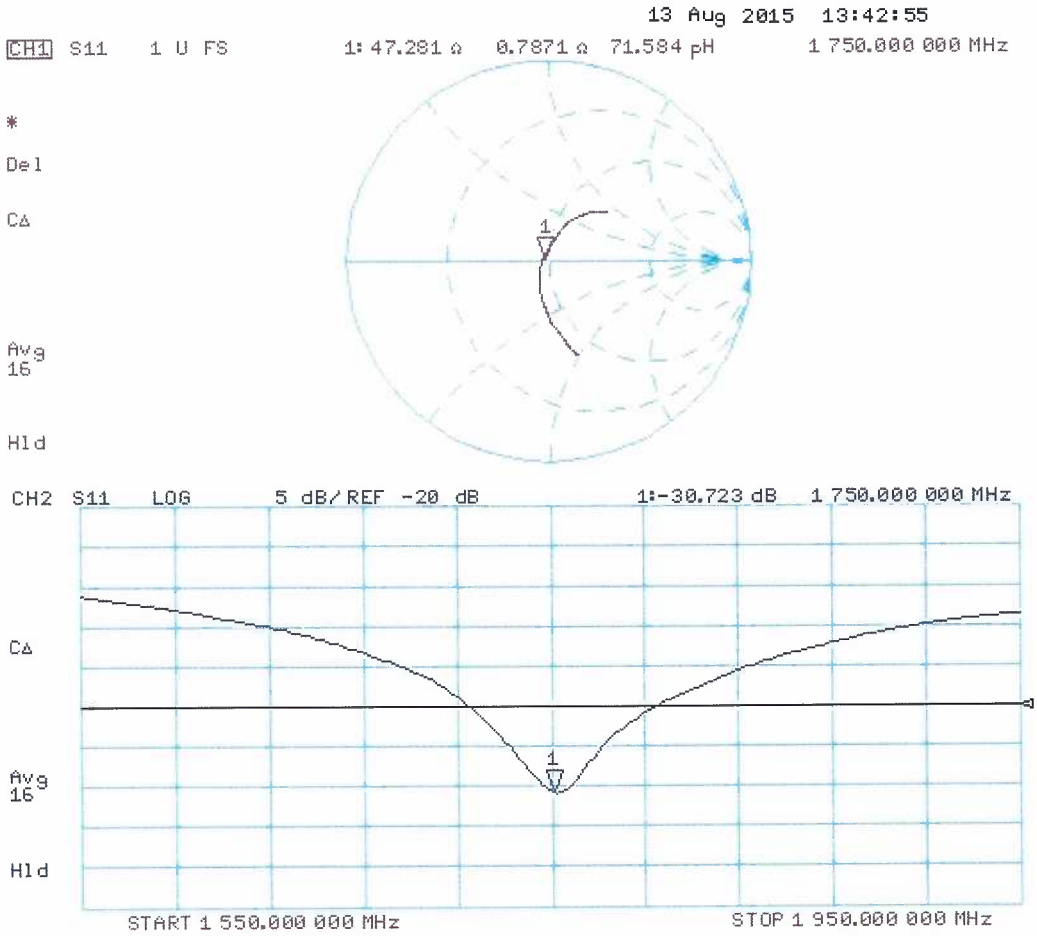
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.33 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.43 W/kg; SAR(10 g) = 5.09 W/kg
Maximum value of SAR (measured) = 11.8 W/kg



0 dB = 11.8 W/kg = 10.72 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client RF Exposure Lab

Certificate No: D1900V2-5d116_Jul18

CALIBRATION CERTIFICATE

Object: D1900V2 - SN:5d116

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 13, 2018

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 16, 2018

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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

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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 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 impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. 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	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.9 ± 6 %	1.34 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	9.90 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.4 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.3 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.70 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.3 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	54.5 Ω + 5.0 jΩ
Return Loss	- 23.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω + 8.3 jΩ
Return Loss	- 21.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 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
Manufactured on	August 21, 2009

DASY5 Validation Report for Head TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d116

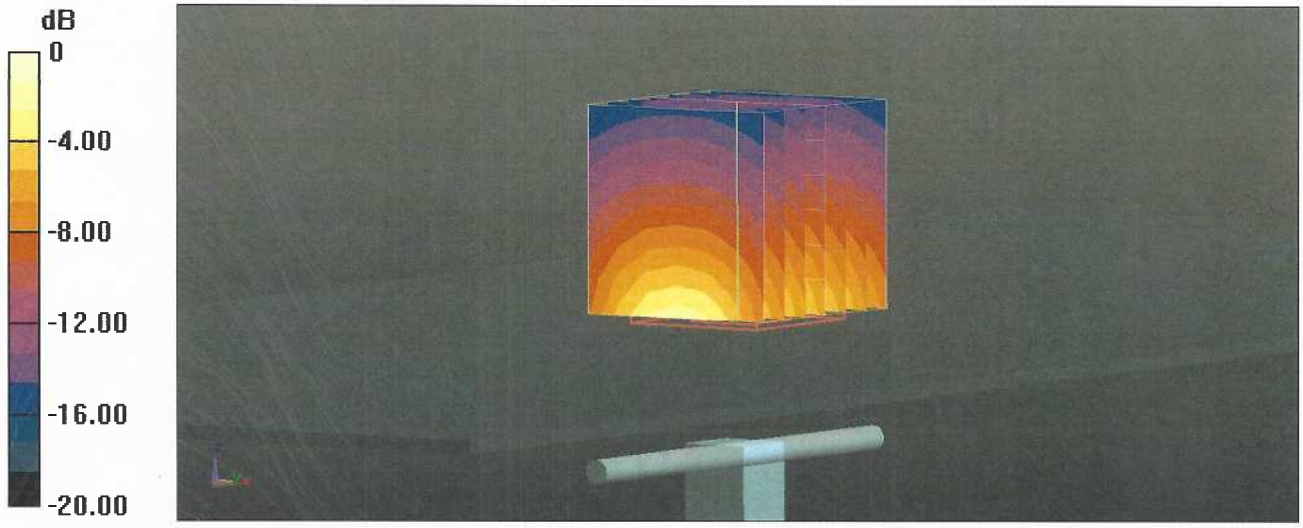
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.34 S/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18) @ 1900 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

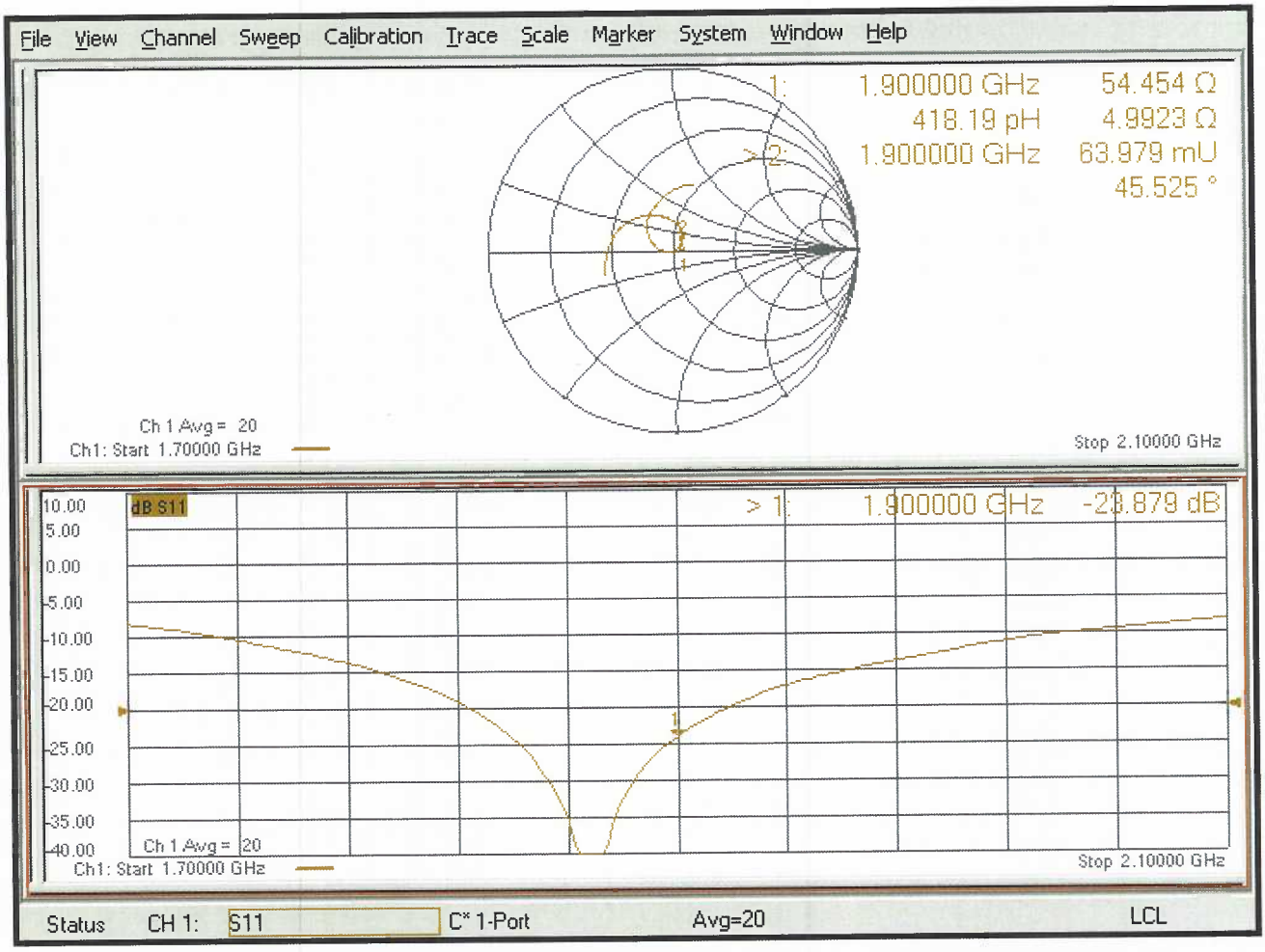
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 111.3 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 18.0 W/kg
SAR(1 g) = 9.9 W/kg; SAR(10 g) = 5.27 W/kg
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d116

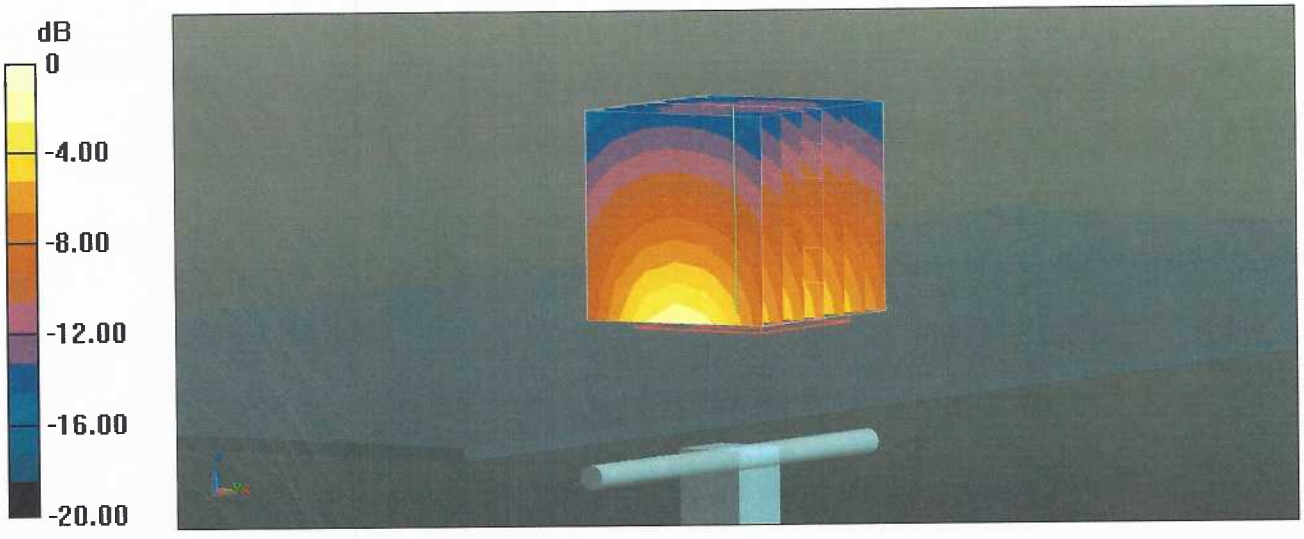
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.46 S/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15) @ 1900 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.5 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.7 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kg = 11.58 dBW/kg

Impedance Measurement Plot for Body TSL