10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	4.55	65.41	17.46	4.96	50.0	± 9.6 %
		Y	4.58	65.52	17.61		50.0	
		Z	4.56	65.64	17.60		50.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.38	65.40	17.04	4.17	50.0	± 9.6 %
		Y	4.41	65.50	17.18		50.0	
		Z	4.35	65.34	16.99		50.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.06	67.11	18.40	6.02	35.0	± 9.6 %
		Y	4.05	67.17	18.58		35.0	
		Z	4.03	67.01	18.26		35.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.35	66.21	18.28	6.02	35.0	± 9.6 %
		Y	4.35	66.28	18.44		35.0	
		Z	4.33	66.18	18.21		35.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	4.24	66.25	18.19	6.02	35.0	± 9.6 %
		Y	4.24	66.31	18.35		35.0	
		Z	4.22	66.21	18.11		35.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	4.22	66.45	18.33	6.02	35.0	± 9.6 %
		Y	4.22	66.51	18.50		35.0	
		Z	4.20	66.39	18.25		35.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.35	66.23	18.34	6.02	35.0	± 9.6 %
		Y	4.36	66.31	18.52		35.0	
		Z	4.33	66.20	18.27		35.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	4.30	66.28	18.28	6.02	35.0	± 9.6 %
		Y	4.31	66.35	18.44		35.0	
		Z	4.29	66.25	18.21		35.0	
10311-AAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	2.88	68.59	16.20	0.00	150.0	± 9.6 %
		Y	2.96	69.02	16.48		150.0	
		Z	2.87	68.53	16.21		150.0	
10313-AAA	iDEN 1:3	X	2.75	69.55	14.37	6.99	70.0	± 9.6 %
		Y	2.79	70.41	14.91		70.0	
		Z	2.48	69.40	14.66		70.0	
10314-AAA	iDEN 1:6	X	3.88	75.45	19.52	10.00	30.0	± 9.6 %
		Y	4.05	76.79	20.24		30.0	
		Z	4.02	76.95	20.46		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.08	63.66	14.90	0.17	150.0	± 9.6 %
		Y	1.10	63.98	15.23		150.0	
		Z	1.08	63.57	14.89		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.34	66.68	16.09	0.17	150.0	± 9.6 %
		Y	4.37	66.78	16.20		150.0	
		Z	4.33	66.69	16.11		150.0	
10317-AAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.34	66.68	16.09	0.17	150.0	± 9.6 %
		Y	4.37	66.78	16.20		150.0	
		Z	4.33	66.69	16.11		150.0	
10400-AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.42	67.04	16.19	0.00	150.0	± 9.6 %
		Y	4.45	67.14	16.30		150.0	
		Z	4.40	67.03	16.20		150.0	
10401-AAC	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.09	66.82	16.20	0.00	150.0	± 9.6 %
		Y	5.11	66.90	16.30		150.0	
		Z	5.07	66.79	16.21		150.0	

10402-AAC	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.45	67.43	16.42	0.00	150.0	± 9.6 %
		Y	5.48	67.49	16.50		150.0	
		Z	5.45	67.42	16.44		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	0.97	65.51	10.99	0.00	115.0	± 9.6 %
		Y	1.07	66.68	11.73		115.0	
		Z	0.93	65.15	10.70		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	0.97	65.51	10.99	0.00	115.0	± 9.6 %
		Y	1.07	66.68	11.73		115.0	
		Z	0.93	65.15	10.70		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	114.78	26.32	0.00	100.0	± 9.6 %
		Y	100.00	116.57	27.06		100.0	
		Z	100.00	115.47	26.53		100.0	
10410-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.10	80.03	17.90	3.23	80.0	± 9.6 %
		Y	6.73	87.51	20.67		80.0	
		Z	3.49	79.61	18.20		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.03	63.15	14.59	0.00	150.0	± 9.6 %
		Y	1.05	63.48	14.92		150.0	
		Z	1.03	63.15	14.60		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.33	66.85	16.18	0.00	150.0	± 9.6 %
		Y	4.36	66.92	16.27		150.0	
		Z	4.32	66.85	16.19		150.0	
10417-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.33	66.85	16.18	0.00	150.0	± 9.6 %
		Y	4.36	66.92	16.27		150.0	
		Z	4.32	66.85	16.19		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.33	67.06	16.24	0.00	150.0	± 9.6 %
		Y	4.35	67.14	16.34		150.0	
		Z	4.32	67.07	16.26		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.34	66.99	16.22	0.00	150.0	± 9.6 %
		Y	4.37	67.06	16.32		150.0	
		Z	4.33	67.00	16.24		150.0	
10422-AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.44	66.96	16.23	0.00	150.0	± 9.6 %
		Y	4.47	67.03	16.33		150.0	
		Z	4.44	66.97	16.25		150.0	
10423-AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.56	67.20	16.31	0.00	150.0	± 9.6 %
		Y	4.59	67.28	16.41		150.0	
		Z	4.55	67.20	16.33		150.0	
10424-AAA	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.49	67.15	16.29	0.00	150.0	± 9.6 %
		Y	4.52	67.23	16.39		150.0	
		Z	4.48	67.15	16.30		150.0	
10425-AAA	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.12	67.29	16.47	0.00	150.0	± 9.6 %
		Y	5.15	67.38	16.57		150.0	
		Z	5.11	67.27	16.48		150.0	
10426-AAA	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.14	67.37	16.51	0.00	150.0	± 9.6 %
		Y	5.17	67.45	16.59		150.0	
		Z	5.13	67.38	16.53		150.0	

10427-AAA	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.10	67.17	16.41	0.00	150.0	± 9.6 %
		Y	5.13	67.24	16.49		150.0	
		Z	5.10	67.18	16.43		150.0	
10430-AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.45	73.55	18.83	0.00	150.0	± 9.6 %
		Y	4.36	73.07	18.66		150.0	
		Z	4.51	73.93	18.97		150.0	
10431-AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	3.93	67.43	16.02	0.00	150.0	± 9.6 %
		Y	3.96	67.55	16.14		150.0	
		Z	3.91	67.44	16.01		150.0	
10432-AAA	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.25	67.26	16.21	0.00	150.0	± 9.6 %
		Y	4.29	67.35	16.32		150.0	
		Z	4.24	67.26	16.22		150.0	
10433-AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.51	67.19	16.32	0.00	150.0	± 9.6 %
		Y	4.54	67.26	16.41		150.0	
		Z	4.50	67.19	16.33		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.61	74.53	18.61	0.00	150.0	± 9.6 %
		Y	4.51	74.05	18.47		150.0	
		Z	4.68	74.88	18.71		150.0	
10435-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.91	79.35	17.61	3.23	80.0	± 9.6 %
		Y	6.25	86.43	20.28		80.0	
		Z	3.34	78.94	17.91		80.0	
10447-AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.14	67.14	14.75	0.00	150.0	± 9.6 %
		Y	3.20	67.36	14.95		150.0	
		Z	3.12	67.09	14.67		150.0	
10448-AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	3.80	67.24	15.90	0.00	150.0	± 9.6 %
		Y	3.84	67.36	16.03		150.0	
		Z	3.79	67.24	15.90		150.0	
10449-AAA	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.10	67.10	16.12	0.00	150.0	± 9.6 %
		Y	4.13	67.19	16.22		150.0	
		Z	4.09	67.10	16.13		150.0	
10450-AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.32	66.97	16.18	0.00	150.0	± 9.6 %
		Y	4.35	67.05	16.27		150.0	
		Z	4.31	66.97	16.19		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	2.91	66.74	13.90	0.00	150.0	± 9.6 %
		Y	2.97	67.02	14.13		150.0	
		Z	2.87	66.63	13.77		150.0	
10456-AAA	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.05	67.79	16.62	0.00	150.0	± 9.6 %
		Y	6.07	67.84	16.68		150.0	
		Z	6.06	67.83	16.67		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.72	65.65	15.92	0.00	150.0	± 9.6 %
		Y	3.74	65.71	16.01		150.0	
		Z	3.72	65.68	15.93		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	2.56	65.08	12.43	0.00	150.0	± 9.6 %
		Y	2.62	65.37	12.69		150.0	
		Z	2.50	64.84	12.20		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	3.65	64.11	14.09	0.00	150.0	± 9.6 %
		Y	3.72	64.38	14.32		150.0	
		Z	3.61	64.01	13.94		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	0.87	67.88	15.88	0.00	150.0	± 9.6 %
		Y	0.94	69.24	16.74		150.0	
		Z	0.87	67.84	15.86		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.73	71.22	15.78	3.29	80.0	± 9.6 %
		Y	2.48	76.95	18.34		80.0	
		Z	1.60	71.21	16.16		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.08	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.19		80.0	
		Z	0.71	60.00	7.22		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.47	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.54		80.0	
		Z	0.73	60.00	6.57		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.37	68.23	13.96	3.23	80.0	± 9.6 %
		Y	1.86	72.93	16.20		80.0	
		Z	1.28	68.36	14.37		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.02	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.12		80.0	
		Z	0.71	60.00	7.16		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.44	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.50		80.0	
		Z	0.73	60.00	6.53		80.0	
10467-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.41	68.72	14.20	3.23	80.0	± 9.6 %
		Y	1.97	73.73	16.55		80.0	
		Z	1.32	68.86	14.63		80.0	
10468-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.04	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.14		80.0	
		Z	0.71	60.00	7.18		80.0	
10469-AAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.44	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.50		80.0	
		Z	0.73	60.00	6.54		80.0	
10470-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.41	68.72	14.19	3.23	80.0	± 9.6 %
		Y	1.97	73.75	16.55		80.0	
		Z	1.32	68.86	14.63		80.0	
10471-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.02	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.13		80.0	
		Z	0.71	60.00	7.17		80.0	
10472-AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.42	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.48		80.0	
		Z	0.73	60.00	6.52		80.0	
10473-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.41	68.68	14.18	3.23	80.0	± 9.6 %
		Y	1.96	73.71	16.53		80.0	
		Z	1.31	68.82	14.61		80.0	
10474-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.02	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.13		80.0	
		Z	0.71	60.00	7.17		80.0	
10475-AAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.42	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.48		80.0	
		Z	0.73	60.00	6.52		80.0	

10477-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.76	60.00	7.00	3.23	80.0	± 9.6 %
		Y	0.72	60.00	7.10		80.0	
		Z	0.71	60.00	7.14		80.0	
10478-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.78	60.00	6.41	3.23	80.0	± 9.6 %
		Y	0.74	60.00	6.47		80.0	
		Z	0.73	60.00	6.51		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.51	75.91	18.12	3.23	80.0	± 9.6 %
		Y	4.65	80.42	20.02		80.0	
		Z	3.35	76.12	18.41		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.06	66.11	12.01	3.23	80.0	± 9.6 %
		Y	2.44	68.39	13.17		80.0	
		Z	2.00	66.36	12.23		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.64	63.45	10.41	3.23	80.0	± 9.6 %
		Y	1.83	64.88	11.25		80.0	
		Z	1.57	63.52	10.52		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.34	62.39	10.63	2.23	80.0	± 9.6 %
		Y	1.43	63.31	11.29		80.0	
		Z	1.27	62.21	10.58		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.46	60.79	8.98	2.23	80.0	± 9.6 %
		Y	1.54	61.54	9.56		80.0	
		Z	1.36	60.41	8.74		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.45	60.53	8.83	2.23	80.0	± 9.6 %
		Y	1.53	61.21	9.38		80.0	
		Z	1.36	60.16	8.59		80.0	
10485-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.93	66.25	13.91	2.23	80.0	± 9.6 %
		Y	2.08	67.57	14.73		80.0	
		Z	1.84	66.09	13.95		80.0	
10486-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.94	63.48	11.80	2.23	80.0	± 9.6 %
		Y	2.04	64.22	12.34		80.0	
		Z	1.86	63.28	11.73		80.0	
10487-AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.96	63.26	11.66	2.23	80.0	± 9.6 %
		Y	2.04	63.94	12.17		80.0	
		Z	1.87	63.04	11.57		80.0	
10488-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.53	67.95	16.02	2.23	80.0	± 9.6 %
		Y	2.66	68.95	16.66		80.0	
		Z	2.42	67.64	16.03		80.0	
10489-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.77	66.35	15.13	2.23	80.0	± 9.6 %
		Y	2.84	66.94	15.57		80.0	
		Z	2.67	66.13	15.12		80.0	
10490-AAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.85	66.30	15.10	2.23	80.0	± 9.6 %
		Y	2.92	66.85	15.53		80.0	
		Z	2.75	66.08	15.09		80.0	
10491-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.93	67.67	16.24	2.23	80.0	± 9.6 %
		Y	3.03	68.38	16.73		80.0	
		Z	2.81	67.35	16.23		80.0	
10492-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.21	66.36	15.71	2.23	80.0	± 9.6 %
		Y	3.26	66.76	16.05		80.0	
		Z	3.11	66.10	15.68		80.0	

10493-AAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.27	66.30	15.68	2.23	80.0	± 9.6 %
		Y	3.32	66.68	16.01		80.0	
		Z	3.17	66.04	15.65		80.0	
10494-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.07	68.52	16.54	2.23	80.0	± 9.6 %
		Y	3.18	69.34	17.07		80.0	
		Z	2.94	68.19	16.54		80.0	
10495-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.24	66.58	15.93	2.23	80.0	± 9.6 %
		Y	3.29	66.98	16.26		80.0	
		Z	3.13	66.30	15.90		80.0	
10496-AAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.33	66.50	15.93	2.23	80.0	± 9.6 %
		Y	3.38	66.87	16.25		80.0	
		Z	3.23	66.23	15.91		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.02	60.00	7.99	2.23	80.0	± 9.6 %
		Y	1.01	60.00	8.17		80.0	
		Z	0.98	60.00	7.95		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.18	60.00	6.81	2.23	80.0	± 9.6 %
		Y	1.17	60.00	6.95		80.0	
		Z	1.14	60.00	6.72		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.20	60.00	6.66	2.23	80.0	± 9.6 %
		Y	1.19	60.00	6.79		80.0	
		Z	1.16	60.00	6.55		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.18	67.02	14.79	2.23	80.0	± 9.6 %
		Y	2.32	68.22	15.55		80.0	
		Z	2.08	66.80	14.82		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.31	64.90	13.20	2.23	80.0	± 9.6 %
		Y	2.41	65.65	13.74		80.0	
		Z	2.22	64.72	13.17		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.34	64.77	13.06	2.23	80.0	± 9.6 %
		Y	2.43	65.49	13.58		80.0	
		Z	2.25	64.59	13.02		80.0	
10503-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.51	67.79	15.92	2.23	80.0	± 9.6 %
		Y	2.63	68.78	16.57		80.0	
		Z	2.39	67.48	15.93		80.0	
10504-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.75	66.25	15.06	2.23	80.0	± 9.6 %
		Y	2.83	66.84	15.51		80.0	
		Z	2.66	66.03	15.05		80.0	
10505-AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.83	66.21	15.04	2.23	80.0	± 9.6 %
		Y	2.91	66.76	15.47		80.0	
		Z	2.73	65.99	15.02		80.0	
10506-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.05	68.40	16.47	2.23	80.0	± 9.6 %
		Y	3.16	69.22	17.00		80.0	
		Z	2.92	68.07	16.47		80.0	
10507-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.22	66.51	15.89	2.23	80.0	± 9.6 %
		Y	3.27	66.92	16.22		80.0	
		Z	3.12	66.24	15.86		80.0	

10508-AAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.32	66.43	15.89	2.23	80.0	± 9.6 %
		Y	3.37	66.80	16.20		80.0	
		Z	3.21	66.16	15.86		80.0	
10509-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.55	68.19	16.49	2.23	80.0	± 9.6 %
		Y	3.64	68.78	16.90		80.0	
		Z	3.42	67.89	16.49		80.0	
10510-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.74	66.59	16.18	2.23	80.0	± 9.6 %
		Y	3.77	66.88	16.45		80.0	
		Z	3.63	66.30	16.15		80.0	
10511-AAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.82	66.51	16.18	2.23	80.0	± 9.6 %
		Y	3.85	66.78	16.44		80.0	
		Z	3.71	66.23	16.15		80.0	
10512-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.53	68.87	16.64	2.23	80.0	± 9.6 %
		Y	3.65	69.60	17.11		80.0	
		Z	3.39	68.55	16.65		80.0	
10513-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.62	66.62	16.20	2.23	80.0	± 9.6 %
		Y	3.66	66.94	16.48		80.0	
		Z	3.51	66.32	16.17		80.0	
10514-AAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.68	66.43	16.16	2.23	80.0	± 9.6 %
		Y	3.72	66.71	16.42		80.0	
		Z	3.58	66.13	16.13		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.99	63.31	14.64	0.00	150.0	± 9.6 %
		Y	1.01	63.68	14.99		150.0	
		Z	0.99	63.31	14.65		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.57	68.71	16.68	0.00	150.0	± 9.6 %
		Y	0.65	71.13	18.13		150.0	
		Z	0.57	68.55	16.63		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.82	64.86	15.16	0.00	150.0	± 9.6 %
		Y	0.85	65.57	15.72		150.0	
		Z	0.83	64.83	15.16		150.0	
10518-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.32	66.96	16.17	0.00	150.0	± 9.6 %
		Y	4.35	67.04	16.27		150.0	
		Z	4.31	66.97	16.19		150.0	
10519-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.46	67.11	16.26	0.00	150.0	± 9.6 %
		Y	4.49	67.19	16.35		150.0	
		Z	4.45	67.12	16.27		150.0	
10520-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.32	67.04	16.17	0.00	150.0	± 9.6 %
		Y	4.35	67.12	16.27		150.0	
		Z	4.31	67.04	16.19		150.0	
10521-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.25	66.99	16.15	0.00	150.0	± 9.6 %
		Y	4.28	67.08	16.25		150.0	
		Z	4.24	66.99	16.16		150.0	
10522-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.29	67.08	16.22	0.00	150.0	± 9.6 %
		Y	4.32	67.17	16.32		150.0	
		Z	4.27	67.07	16.22		150.0	

10523-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.24	67.16	16.19	0.00	150.0	± 9.6 %
		Y	4.27	67.25	16.30		150.0	
		Z	4.23	67.18	16.21		150.0	
10524-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.25	67.08	16.24	0.00	150.0	± 9.6 %
		Y	4.28	67.17	16.34		150.0	
		Z	4.24	67.08	16.25		150.0	
10525-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.30	66.23	15.88	0.00	150.0	± 9.6 %
		Y	4.32	66.32	15.98		150.0	
		Z	4.29	66.24	15.90		150.0	
10526-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.40	66.47	15.98	0.00	150.0	± 9.6 %
		Y	4.43	66.56	16.08		150.0	
		Z	4.39	66.47	15.99		150.0	
10527-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.34	66.45	15.93	0.00	150.0	± 9.6 %
		Y	4.37	66.54	16.03		150.0	
		Z	4.33	66.45	15.94		150.0	
10528-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.35	66.46	15.96	0.00	150.0	± 9.6 %
		Y	4.38	66.56	16.06		150.0	
		Z	4.34	66.46	15.97		150.0	
10529-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.35	66.46	15.96	0.00	150.0	± 9.6 %
		Y	4.38	66.56	16.06		150.0	
		Z	4.34	66.46	15.97		150.0	
10531-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.31	66.46	15.92	0.00	150.0	± 9.6 %
		Y	4.34	66.56	16.03		150.0	
		Z	4.30	66.45	15.93		150.0	
10532-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.20	66.33	15.86	0.00	150.0	± 9.6 %
		Y	4.23	66.43	15.96		150.0	
		Z	4.19	66.33	15.87		150.0	
10533-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.35	66.55	15.96	0.00	150.0	± 9.6 %
		Y	4.39	66.64	16.06		150.0	
		Z	4.34	66.55	15.98		150.0	
10534-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	4.92	66.42	16.02	0.00	150.0	± 9.6 %
		Y	4.95	66.49	16.11		150.0	
		Z	4.91	66.42	16.04		150.0	
10535-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	4.95	66.52	16.07	0.00	150.0	± 9.6 %
		Y	4.98	66.59	16.16		150.0	
		Z	4.94	66.51	16.09		150.0	
10536-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	4.85	66.53	16.05	0.00	150.0	± 9.6 %
		Y	4.87	66.61	16.14		150.0	
		Z	4.84	66.52	16.07		150.0	
10537-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	4.92	66.56	16.07	0.00	150.0	± 9.6 %
		Y	4.95	66.63	16.16		150.0	
		Z	4.92	66.56	16.10		150.0	
10538-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	4.97	66.48	16.07	0.00	150.0	± 9.6 %
		Y	5.00	66.56	16.15		150.0	
		Z	4.96	66.47	16.09		150.0	
10540-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	4.90	66.44	16.07	0.00	150.0	± 9.6 %
		Y	4.93	66.52	16.16		150.0	
		Z	4.90	66.43	16.09		150.0	

10541-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	4.90	66.40	16.03	0.00	150.0	± 9.6 %
		Y	4.92	66.46	16.11		150.0	
		Z	4.89	66.39	16.04		150.0	
10542-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.05	66.48	16.09	0.00	150.0	± 9.6 %
		Y	5.07	66.55	16.17		150.0	
		Z	5.04	66.48	16.10		150.0	
10543-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.12	66.59	16.17	0.00	150.0	± 9.6 %
		Y	5.15	66.65	16.25		150.0	
		Z	5.12	66.59	16.19		150.0	
10544-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.27	66.48	16.01	0.00	150.0	± 9.6 %
		Y	5.30	66.55	16.09		150.0	
		Z	5.27	66.47	16.03		150.0	
10545-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.43	66.89	16.18	0.00	150.0	± 9.6 %
		Y	5.46	66.97	16.26		150.0	
		Z	5.43	66.89	16.20		150.0	
10546-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.30	66.59	16.04	0.00	150.0	± 9.6 %
		Y	5.33	66.66	16.12		150.0	
		Z	5.30	66.57	16.05		150.0	
10547-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.39	66.74	16.11	0.00	150.0	± 9.6 %
		Y	5.41	66.81	16.19		150.0	
		Z	5.39	66.75	16.14		150.0	
10548-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.49	67.22	16.33	0.00	150.0	± 9.6 %
		Y	5.52	67.32	16.42		150.0	
		Z	5.48	67.21	16.34		150.0	
10550-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.37	66.82	16.16	0.00	150.0	± 9.6 %
		Y	5.39	66.89	16.25		150.0	
		Z	5.37	66.84	16.20		150.0	
10551-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.29	66.55	15.99	0.00	150.0	± 9.6 %
		Y	5.31	66.62	16.07		150.0	
		Z	5.28	66.52	16.01		150.0	
10552-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.28	66.62	16.03	0.00	150.0	± 9.6 %
		Y	5.31	66.69	16.11		150.0	
		Z	5.28	66.61	16.05		150.0	
10553-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.33	66.55	16.02	0.00	150.0	± 9.6 %
		Y	5.35	66.61	16.10		150.0	
		Z	5.32	66.53	16.04		150.0	
10554-AAA	IEEE 1602.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.70	66.81	16.09	0.00	150.0	± 9.6 %
		Y	5.73	66.87	16.16		150.0	
		Z	5.70	66.79	16.10		150.0	
10555-AAA	IEEE 1602.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	5.78	66.99	16.17	0.00	150.0	± 9.6 %
		Y	5.80	67.06	16.24		150.0	
		Z	5.78	66.97	16.18		150.0	
10556-AAA	IEEE 1602.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	5.82	67.12	16.22	0.00	150.0	± 9.6 %
		Y	5.85	67.19	16.30		150.0	
		Z	5.83	67.12	16.24		150.0	
10557-AAA	IEEE 1602.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	5.78	67.00	16.18	0.00	150.0	± 9.6 %
		Y	5.80	67.06	16.25		150.0	
		Z	5.78	66.98	16.19		150.0	

10558-AAA	IEEE 1602.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	5.77	67.00	16.19	0.00	150.0	± 9.6 %
		Y	5.80	67.07	16.27		150.0	
		Z	5.76	66.96	16.20		150.0	
10560-AAA	IEEE 1602.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	5.80	66.97	16.21	0.00	150.0	± 9.6 %
		Y	5.83	67.03	16.29		150.0	
		Z	5.80	66.94	16.23		150.0	
10561-AAA	IEEE 1602.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.73	66.94	16.23	0.00	150.0	± 9.6 %
		Y	5.76	67.01	16.31		150.0	
		Z	5.73	66.92	16.25		150.0	
10562-AAA	IEEE 1602.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	5.77	67.07	16.30	0.00	150.0	± 9.6 %
		Y	5.80	67.15	16.38		150.0	
		Z	5.77	67.04	16.31		150.0	
10563-AAA	IEEE 1602.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	5.88	67.08	16.27	0.00	150.0	± 9.6 %
		Y	5.91	67.16	16.35		150.0	
		Z	5.88	67.06	16.28		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.62	66.91	16.26	0.46	150.0	± 9.6 %
		Y	4.65	67.00	16.37		150.0	
		Z	4.62	66.92	16.27		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	4.82	67.35	16.60	0.46	150.0	± 9.6 %
		Y	4.84	67.41	16.69		150.0	
		Z	4.81	67.36	16.62		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.65	67.13	16.38	0.46	150.0	± 9.6 %
		Y	4.68	67.22	16.48		150.0	
		Z	4.64	67.13	16.40		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.70	67.59	16.80	0.46	150.0	± 9.6 %
		Y	4.72	67.63	16.88		150.0	
		Z	4.69	67.60	16.83		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.52	66.74	16.04	0.46	150.0	± 9.6 %
		Y	4.56	66.86	16.17		150.0	
		Z	4.51	66.72	16.04		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.69	67.86	16.96	0.46	150.0	± 9.6 %
		Y	4.72	67.90	17.03		150.0	
		Z	4.69	67.89	17.00		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.68	67.60	16.83	0.46	150.0	± 9.6 %
		Y	4.71	67.65	16.91		150.0	
		Z	4.67	67.61	16.85		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.14	63.82	14.89	0.46	130.0	± 9.6 %
		Y	1.15	64.13	15.24		130.0	
		Z	1.12	63.61	14.84		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.14	64.32	15.21	0.46	130.0	± 9.6 %
		Y	1.16	64.65	15.58		130.0	
		Z	1.13	64.09	15.17		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	1.07	74.72	18.97	0.46	130.0	± 9.6 %
		Y	1.28	78.28	20.78		130.0	
		Z	0.96	73.37	18.65		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.18	68.96	17.73	0.46	130.0	± 9.6 %
		Y	1.21	69.63	18.27		130.0	
		Z	1.15	68.56	17.65		130.0	

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.39	66.58	16.17	0.46	130.0	± 9.6 %
		Y	4.42	66.67	16.29		130.0	
		Z	4.38	66.59	16.19		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.42	66.82	16.28	0.46	130.0	± 9.6 %
		Y	4.45	66.90	16.39		130.0	
		Z	4.41	66.83	16.31		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.57	67.04	16.43	0.46	130.0	± 9.6 %
		Y	4.60	67.12	16.53		130.0	
		Z	4.56	67.05	16.45		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.49	67.21	16.56	0.46	130.0	± 9.6 %
		Y	4.51	67.28	16.65		130.0	
		Z	4.48	67.22	16.59		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.22	66.25	15.71	0.46	130.0	± 9.6 %
		Y	4.25	66.38	15.85		130.0	
		Z	4.21	66.24	15.71		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.24	66.27	15.70	0.46	130.0	± 9.6 %
		Y	4.28	66.41	15.85		130.0	
		Z	4.23	66.24	15.70		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.40	67.30	16.54	0.46	130.0	± 9.6 %
		Y	4.43	67.38	16.64		130.0	
		Z	4.39	67.32	16.57		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.14	65.99	15.46	0.46	130.0	± 9.6 %
		Y	4.18	66.13	15.62		130.0	
		Z	4.12	65.96	15.46		130.0	
10583-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.39	66.58	16.17	0.46	130.0	± 9.6 %
		Y	4.42	66.67	16.29		130.0	
		Z	4.38	66.59	16.19		130.0	
10584-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.42	66.82	16.28	0.46	130.0	± 9.6 %
		Y	4.45	66.90	16.39		130.0	
		Z	4.41	66.83	16.31		130.0	
10585-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.57	67.04	16.43	0.46	130.0	± 9.6 %
		Y	4.60	67.12	16.53		130.0	
		Z	4.56	67.05	16.45		130.0	
10586-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.49	67.21	16.56	0.46	130.0	± 9.6 %
		Y	4.51	67.28	16.65		130.0	
		Z	4.48	67.22	16.59		130.0	
10587-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.22	66.25	15.71	0.46	130.0	± 9.6 %
		Y	4.25	66.38	15.85		130.0	
		Z	4.21	66.24	15.71		130.0	
10588-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.24	66.27	15.70	0.46	130.0	± 9.6 %
		Y	4.28	66.41	15.85		130.0	
		Z	4.23	66.24	15.70		130.0	
10589-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.40	67.30	16.54	0.46	130.0	± 9.6 %
		Y	4.43	67.38	16.64		130.0	
		Z	4.39	67.32	16.57		130.0	
10590-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.14	65.99	15.46	0.46	130.0	± 9.6 %
		Y	4.18	66.13	15.62		130.0	
		Z	4.12	65.96	15.46		130.0	

10591-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.55	66.71	16.33	0.46	130.0	± 9.6 %
		Y	4.58	66.79	16.43		130.0	
		Z	4.54	66.72	16.35		130.0	
10592-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.66	66.97	16.44	0.46	130.0	± 9.6 %
		Y	4.68	67.05	16.55		130.0	
		Z	4.65	66.98	16.47		130.0	
10593-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.57	66.83	16.29	0.46	130.0	± 9.6 %
		Y	4.60	66.92	16.40		130.0	
		Z	4.56	66.84	16.31		130.0	
10594-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.63	67.03	16.47	0.46	130.0	± 9.6 %
		Y	4.66	67.11	16.57		130.0	
		Z	4.62	67.04	16.49		130.0	
10595-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.59	67.00	16.37	0.46	130.0	± 9.6 %
		Y	4.62	67.08	16.48		130.0	
		Z	4.58	67.00	16.39		130.0	
10596-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.52	66.92	16.34	0.46	130.0	± 9.6 %
		Y	4.55	67.02	16.46		130.0	
		Z	4.51	66.92	16.36		130.0	
10597-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.47	66.79	16.19	0.46	130.0	± 9.6 %
		Y	4.50	66.89	16.31		130.0	
		Z	4.46	66.78	16.20		130.0	
10598-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.48	67.08	16.50	0.46	130.0	± 9.6 %
		Y	4.51	67.15	16.60		130.0	
		Z	4.47	67.09	16.52		130.0	
10599-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.24	67.14	16.59	0.46	130.0	± 9.6 %
		Y	5.26	67.22	16.69		130.0	
		Z	5.24	67.17	16.63		130.0	
10600-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.31	67.40	16.69	0.46	130.0	± 9.6 %
		Y	5.34	67.51	16.81		130.0	
		Z	5.31	67.43	16.73		130.0	
10601-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.24	67.31	16.67	0.46	130.0	± 9.6 %
		Y	5.27	67.39	16.76		130.0	
		Z	5.25	67.36	16.72		130.0	
10602-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.30	67.20	16.52	0.46	130.0	± 9.6 %
		Y	5.33	67.30	16.63		130.0	
		Z	5.29	67.21	16.55		130.0	
10603-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.36	67.49	16.82	0.46	130.0	± 9.6 %
		Y	5.39	67.59	16.92		130.0	
		Z	5.35	67.49	16.85		130.0	
10604-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.23	67.04	16.56	0.46	130.0	± 9.6 %
		Y	5.26	67.13	16.66		130.0	
		Z	5.22	67.02	16.58		130.0	
10605-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.29	67.25	16.66	0.46	130.0	± 9.6 %
		Y	5.32	67.35	16.78		130.0	
		Z	5.29	67.26	16.69		130.0	
10606-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.11	66.78	16.27	0.46	130.0	± 9.6 %
		Y	5.14	66.88	16.39		130.0	
		Z	5.11	66.80	16.31		130.0	

10607-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.40	66.05	15.97	0.46	130.0	± 9.6 %
		Y	4.43	66.14	16.08		130.0	
		Z	4.39	66.06	16.00		130.0	
10608-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.52	66.33	16.10	0.46	130.0	± 9.6 %
		Y	4.55	66.43	16.21		130.0	
		Z	4.51	66.34	16.13		130.0	
10609-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.41	66.15	15.91	0.46	130.0	± 9.6 %
		Y	4.45	66.26	16.03		130.0	
		Z	4.40	66.16	15.93		130.0	
10610-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.47	66.34	16.10	0.46	130.0	± 9.6 %
		Y	4.50	66.44	16.21		130.0	
		Z	4.46	66.36	16.12		130.0	
10611-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.38	66.11	15.92	0.46	130.0	± 9.6 %
		Y	4.41	66.22	16.04		130.0	
		Z	4.37	66.12	15.94		130.0	
10612-AAA	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.35	66.19	15.93	0.46	130.0	± 9.6 %
		Y	4.39	66.31	16.06		130.0	
		Z	4.34	66.18	15.94		130.0	
10613-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.35	66.00	15.77	0.46	130.0	± 9.6 %
		Y	4.39	66.13	15.90		130.0	
		Z	4.34	66.00	15.79		130.0	
10614-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.34	66.30	16.07	0.46	130.0	± 9.6 %
		Y	4.37	66.40	16.18		130.0	
		Z	4.33	66.31	16.10		130.0	
10615-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.36	65.90	15.65	0.46	130.0	± 9.6 %
		Y	4.40	66.04	15.79		130.0	
		Z	4.35	65.90	15.67		130.0	
10616-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.03	66.30	16.16	0.46	130.0	± 9.6 %
		Y	5.06	66.38	16.26		130.0	
		Z	5.03	66.31	16.19		130.0	
10617-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.05	66.37	16.17	0.46	130.0	± 9.6 %
		Y	5.09	66.47	16.28		130.0	
		Z	5.05	66.38	16.20		130.0	
10618-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	4.97	66.45	16.23	0.46	130.0	± 9.6 %
		Y	5.00	66.54	16.33		130.0	
		Z	4.97	66.45	16.26		130.0	
10619-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.00	66.32	16.09	0.46	130.0	± 9.6 %
		Y	5.04	66.42	16.20		130.0	
		Z	5.01	66.34	16.13		130.0	
10620-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.06	66.27	16.11	0.46	130.0	± 9.6 %
		Y	5.09	66.36	16.22		130.0	
		Z	5.05	66.27	16.14		130.0	
10621-AAA	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.08	66.45	16.34	0.46	130.0	± 9.6 %
		Y	5.11	66.51	16.42		130.0	
		Z	5.08	66.46	16.37		130.0	
10622-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.07	66.51	16.37	0.46	130.0	± 9.6 %
		Y	5.09	66.59	16.45		130.0	
		Z	5.06	66.52	16.40		130.0	

10623-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	4.96	66.07	15.99	0.46	130.0	± 9.6 %
		Y	4.99	66.16	16.09		130.0	
		Z	4.96	66.07	16.02		130.0	
10624-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.15	66.33	16.19	0.46	130.0	± 9.6 %
		Y	5.18	66.41	16.29		130.0	
		Z	5.15	66.34	16.22		130.0	
10625-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.25	66.51	16.35	0.46	130.0	± 9.6 %
		Y	5.27	66.57	16.43		130.0	
		Z	5.25	66.56	16.40		130.0	
10626-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.37	66.32	16.12	0.46	130.0	± 9.6 %
		Y	5.40	66.40	16.21		130.0	
		Z	5.37	66.32	16.15		130.0	
10627-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.58	66.89	16.38	0.46	130.0	± 9.6 %
		Y	5.61	66.98	16.48		130.0	
		Z	5.58	66.90	16.42		130.0	
10628-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.35	66.26	15.99	0.46	130.0	± 9.6 %
		Y	5.38	66.35	16.09		130.0	
		Z	5.35	66.25	16.01		130.0	
10629-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.47	66.50	16.11	0.46	130.0	± 9.6 %
		Y	5.50	66.59	16.21		130.0	
		Z	5.48	66.54	16.15		130.0	
10630-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	5.62	67.17	16.45	0.46	130.0	± 9.6 %
		Y	5.67	67.30	16.57		130.0	
		Z	5.62	67.15	16.47		130.0	
10631-AAA	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	5.65	67.38	16.76	0.46	130.0	± 9.6 %
		Y	5.68	67.44	16.84		130.0	
		Z	5.65	67.38	16.79		130.0	
10632-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.61	67.17	16.67	0.46	130.0	± 9.6 %
		Y	5.63	67.23	16.75		130.0	
		Z	5.62	67.22	16.73		130.0	
10633-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.38	66.36	16.08	0.46	130.0	± 9.6 %
		Y	5.41	66.43	16.17		130.0	
		Z	5.37	66.34	16.10		130.0	
10634-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.42	66.59	16.25	0.46	130.0	± 9.6 %
		Y	5.45	66.66	16.34		130.0	
		Z	5.42	66.59	16.28		130.0	
10635-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.25	65.74	15.52	0.46	130.0	± 9.6 %
		Y	5.29	65.85	15.64		130.0	
		Z	5.25	65.72	15.54		130.0	
10636-AAA	IEEE 1602.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.81	66.67	16.21	0.46	130.0	± 9.6 %
		Y	5.84	66.74	16.30		130.0	
		Z	5.82	66.67	16.24		130.0	
10637-AAA	IEEE 1602.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	5.91	66.92	16.32	0.46	130.0	± 9.6 %
		Y	5.94	67.00	16.42		130.0	
		Z	5.91	66.92	16.35		130.0	
10638-AAA	IEEE 1602.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	5.95	67.05	16.36	0.46	130.0	± 9.6 %
		Y	5.98	67.13	16.46		130.0	
		Z	5.96	67.06	16.40		130.0	

10639-AAA	IEEE 1602.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	5.90	66.89	16.33	0.46	130.0	± 9.6 %
		Y	5.93	66.97	16.42		130.0	
		Z	5.90	66.89	16.36		130.0	
10640-AAA	IEEE 1602.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	5.83	66.70	16.17	0.46	130.0	± 9.6 %
		Y	5.86	66.79	16.27		130.0	
		Z	5.83	66.67	16.19		130.0	
10641-AAA	IEEE 1602.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	5.95	66.83	16.26	0.46	130.0	± 9.6 %
		Y	5.98	66.93	16.36		130.0	
		Z	5.95	66.84	16.29		130.0	
10642-AAA	IEEE 1602.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	5.98	67.06	16.55	0.46	130.0	± 9.6 %
		Y	6.00	67.13	16.63		130.0	
		Z	5.98	67.06	16.58		130.0	
10643-AAA	IEEE 1602.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	5.81	66.70	16.25	0.46	130.0	± 9.6 %
		Y	5.84	66.79	16.35		130.0	
		Z	5.81	66.69	16.27		130.0	
10644-AAA	IEEE 1602.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	5.86	66.86	16.35	0.46	130.0	± 9.6 %
		Y	5.89	66.95	16.45		130.0	
		Z	5.86	66.84	16.37		130.0	
10645-AAA	IEEE 1602.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	5.99	66.94	16.36	0.46	130.0	± 9.6 %
		Y	6.02	67.02	16.45		130.0	
		Z	6.00	66.95	16.39		130.0	
10646-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	6.69	86.81	28.67	9.30	60.0	± 9.6 %
		Y	7.72	91.33	30.89		60.0	
		Z	5.52	83.14	27.53		60.0	
10647-AAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	5.99	84.97	28.10	9.30	60.0	± 9.6 %
		Y	6.77	88.96	30.17		60.0	
		Z	4.99	81.44	26.98		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.51	61.86	8.44	0.00	150.0	± 9.6 %
		Y	0.54	62.46	8.97		150.0	
		Z	0.50	61.70	8.25		150.0	

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

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

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Accreditation No.: SCS 0108

Client **Sporton (Auden)**

Certificate No: EX3-3857_May17

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3857

Calibration procedure(s): QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: May 26, 2017

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-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	31-Dec-16 (No. ES3-3013_Dec16)	Dec-17
DAE4	SN: 660	7-Dec-16 (No. DAE4-660_Dec16)	Dec-17
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: May 30, 2017

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

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) 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"

Methods Applied and Interpretation of Parameters:

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

Probe EX3DV4

SN:3857

Manufactured: January 23, 2012
Calibrated: May 26, 2017

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.17	0.42	0.44	± 10.1 %
DCP (mV)[B]	98.5	100.1	102.4	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	139.2	±3.8 %
		Y	0.0	0.0	1.0		147.4	
		Z	0.0	0.0	1.0		144.9	

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

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
750	41.9	0.89	10.01	10.01	10.01	0.39	0.99	± 12.0 %
835	41.5	0.90	9.73	9.73	9.73	0.47	0.85	± 12.0 %
900	41.5	0.97	9.48	9.48	9.48	0.31	1.01	± 12.0 %
1750	40.1	1.37	8.47	8.47	8.47	0.38	0.82	± 12.0 %
1900	40.0	1.40	8.29	8.29	8.29	0.38	0.80	± 12.0 %
2000	40.0	1.40	8.26	8.26	8.26	0.35	0.80	± 12.0 %
2300	39.5	1.67	7.95	7.95	7.95	0.24	1.08	± 12.0 %
2450	39.2	1.80	7.71	7.71	7.71	0.41	0.80	± 12.0 %
2600	39.0	1.96	7.62	7.62	7.62	0.41	0.90	± 12.0 %
3500	37.9	2.91	7.37	7.37	7.37	0.29	1.25	± 13.1 %
3700	37.7	3.12	6.94	6.94	6.94	0.25	1.25	± 13.1 %
5250	35.9	4.71	5.39	5.39	5.39	0.35	1.80	± 13.1 %
5600	35.5	5.07	5.04	5.04	5.04	0.40	1.80	± 13.1 %
5750	35.4	5.22	5.34	5.34	5.34	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Calibration Parameter Determined in Body Tissue Simulating Media

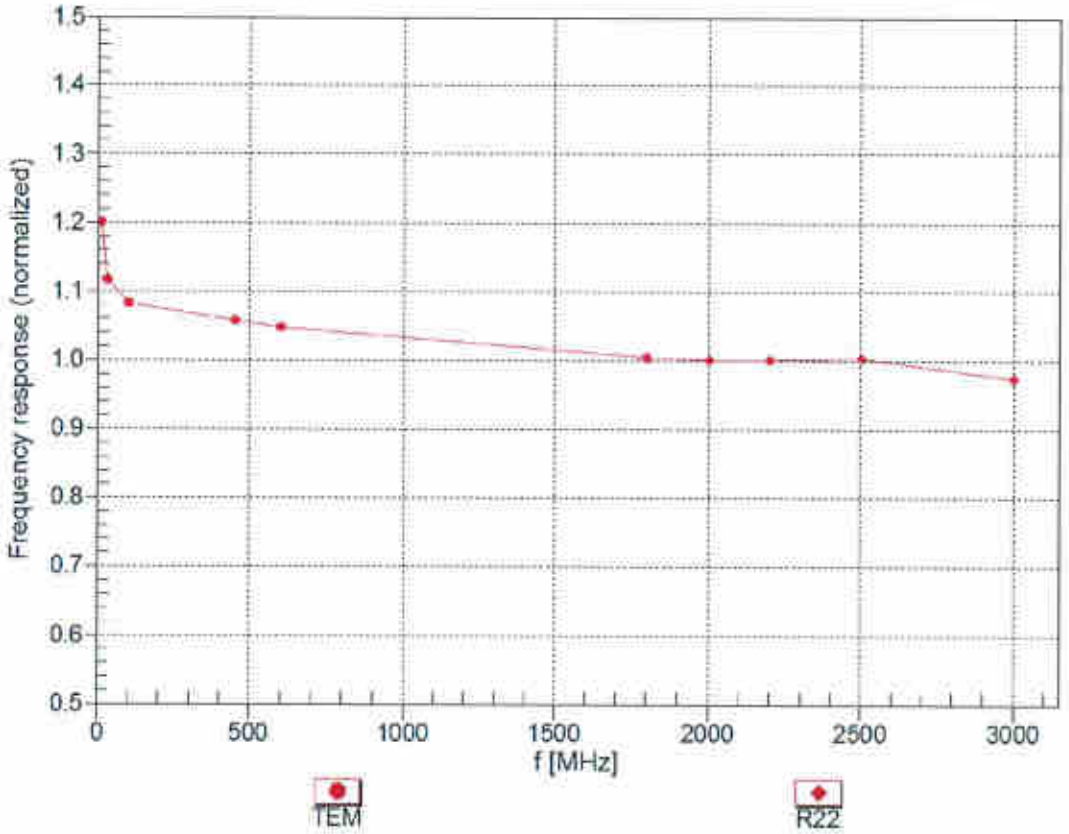
f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
750	55.5	0.96	9.96	9.96	9.96	0.44	0.80	± 12.0 %
835	55.2	0.97	9.72	9.72	9.72	0.46	0.80	± 12.0 %
1750	53.4	1.49	8.29	8.29	8.29	0.36	0.80	± 12.0 %
1900	53.3	1.52	8.08	8.08	8.08	0.37	0.80	± 12.0 %
2300	52.9	1.81	7.87	7.87	7.87	0.39	0.87	± 12.0 %
2450	52.7	1.95	7.70	7.70	7.70	0.40	0.80	± 12.0 %
2600	52.5	2.16	7.59	7.59	7.59	0.34	0.92	± 12.0 %
3500	51.3	3.31	6.89	6.89	6.89	0.30	1.20	± 13.1 %
3700	51.0	3.55	6.82	6.82	6.82	0.30	1.20	± 13.1 %
5250	48.9	5.36	4.72	4.72	4.72	0.40	1.90	± 13.1 %
5600	48.5	5.77	4.01	4.01	4.01	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.31	4.31	4.31	0.50	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

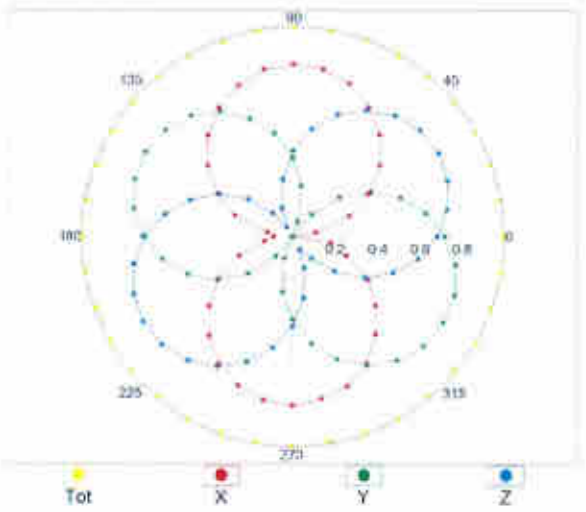
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



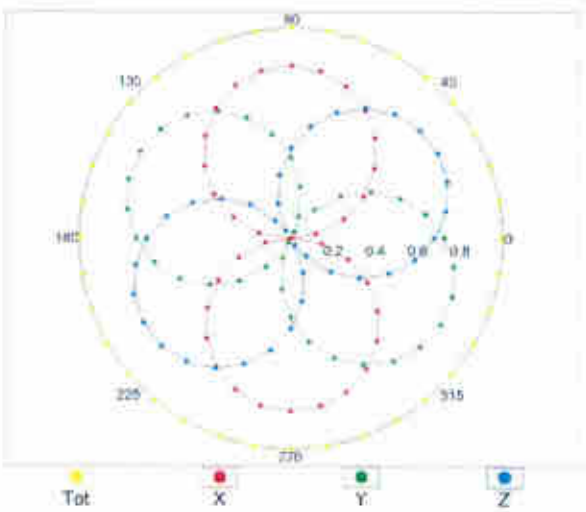
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

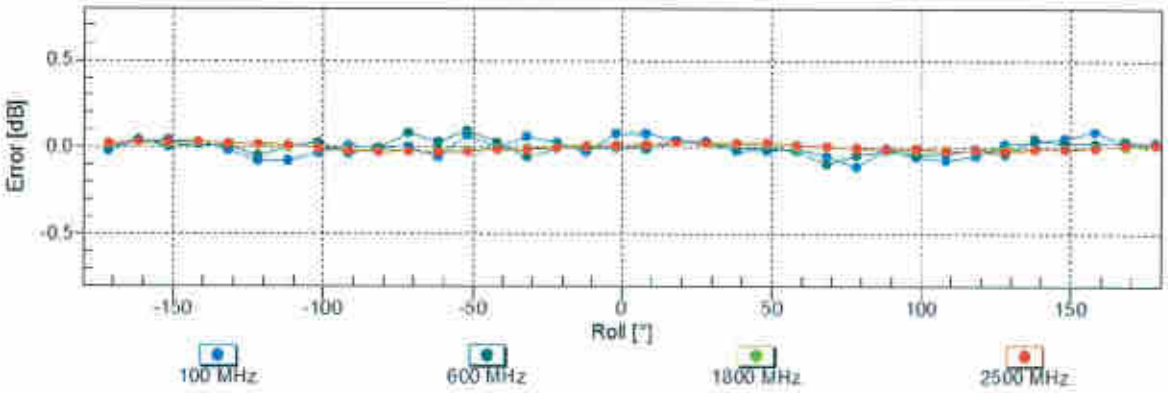
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



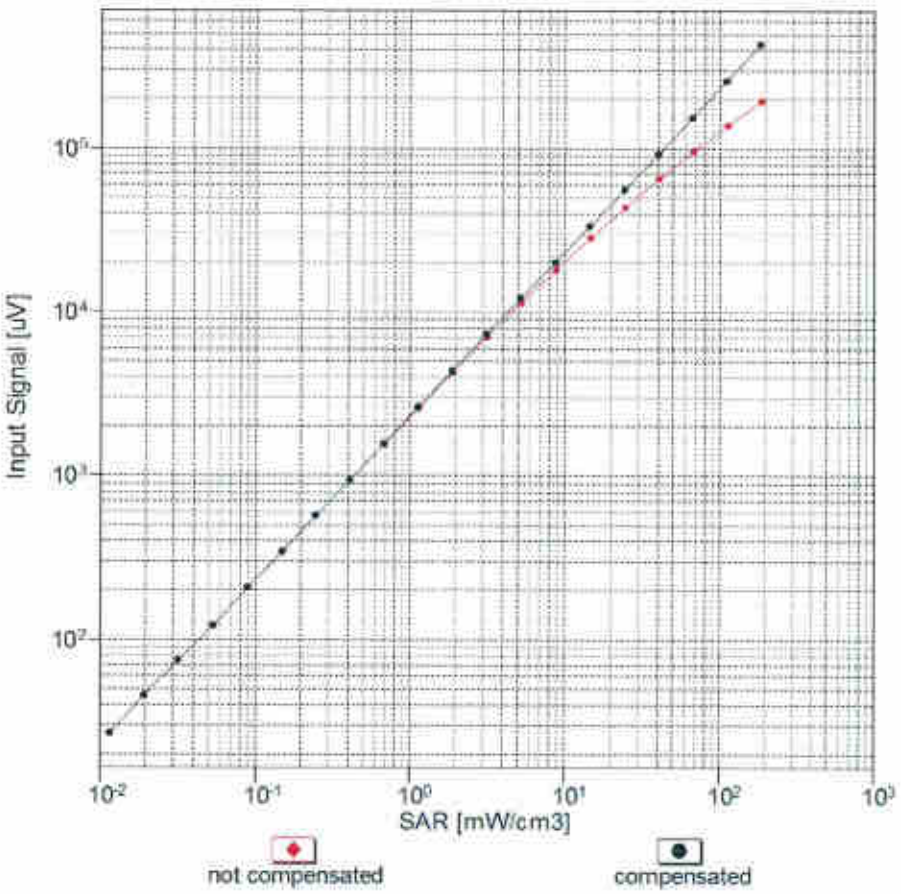
f=1800 MHz,R22

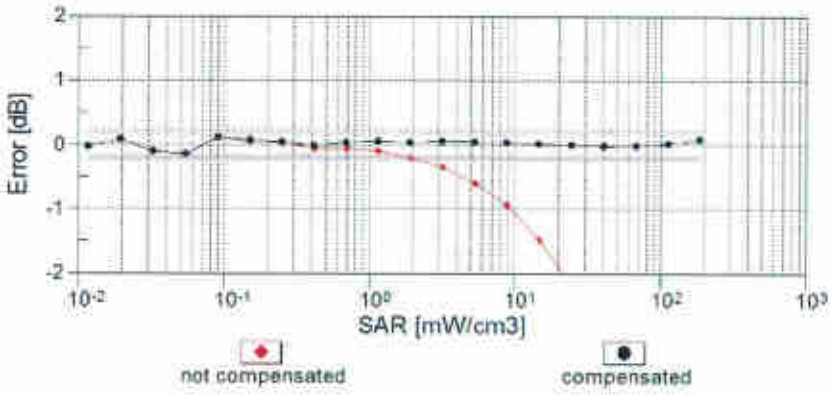




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)

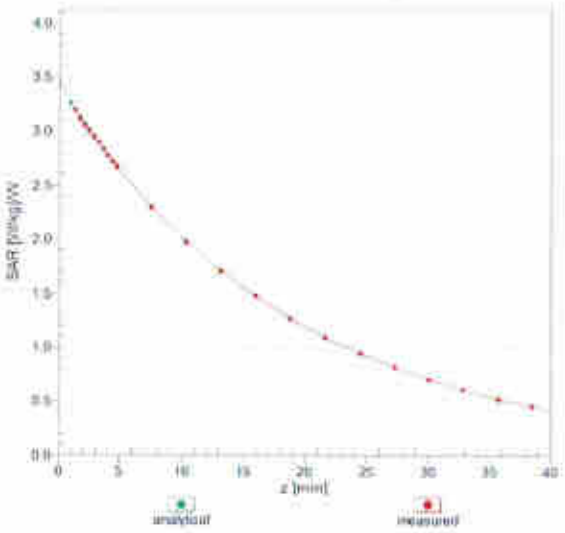




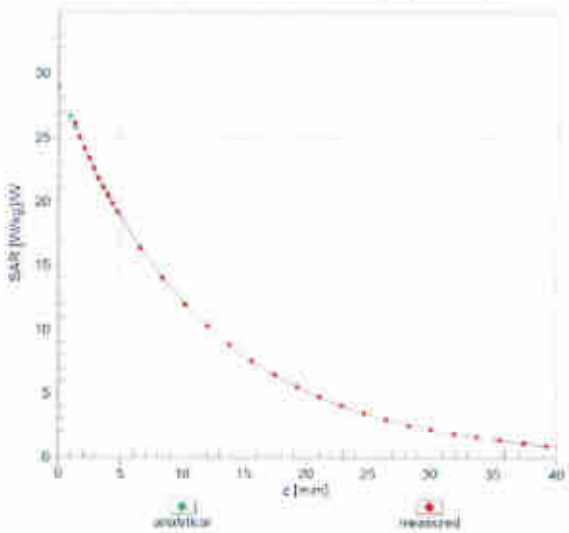
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

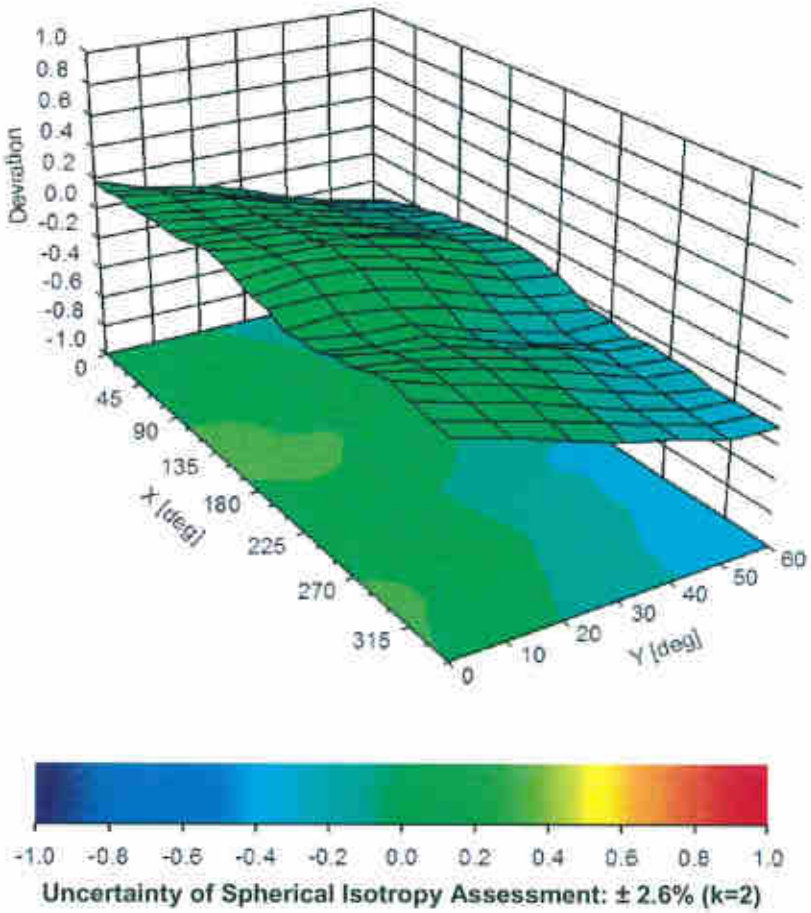


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-41.9
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

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CALIBRATION
CNAS L0570

Client **Sporton International INC** **Certificate No: Z17-97152**

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3293
Calibration Procedure(s)	FF-Z11-004-01 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	September 25, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-17 (CTTL, No.J17X05857)	Jun-18
Power sensor NRP-Z91	101547	27-Jun-17 (CTTL, No.J17X05857)	Jun-18
Power sensor NRP-Z91	101548	27-Jun-17 (CTTL, No.J17X05857)	Jun-18
Reference10dBAttenuator	18N50W-10dB	13-Mar-16(CTTL,No.J16X01547)	Mar-18
Reference20dBAttenuator	18N50W-20dB	13-Mar-16(CTTL, No.J16X01548)	Mar-18
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 549	13-Dec-16(SPEAG, No.DAE4-549_Dec16)	Dec -17
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
SignalGeneratorMG3700A	6201052605	27-Jun-17 (CTTL, No.J17X05858)	Jun-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan -18

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Zhao Jing	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 27, 2017

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CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Glossary:

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A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center) θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

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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

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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

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Methods Applied and Interpretation of Parameters:

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

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CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Probe ES3DV3

SN: 3293

Calibrated: September 25, 2017

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
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E-mail: cttl@chinattl.com Http://www.chinattl.cn

DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3293

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)[A]	1.12	0.90	0.76	±10.0%
DCP(mV)[B]	105.5	108.7	109.8	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	286.1	±2.8%
		Y	0.0	0.0	1.0		254.6	
		Z	0.0	0.0	1.0		232.5	

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

[A] The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and Page 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3293

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	6.47	6.47	6.47	0.60	1.15	±12.1%
835	41.5	0.90	6.30	6.30	6.30	0.41	1.47	±12.1%
900	41.5	0.97	6.34	6.34	6.34	0.41	1.49	±12.1%
1450	40.5	1.20	5.45	5.45	5.45	0.32	1.67	±12.1%
1750	40.1	1.37	5.32	5.32	5.32	0.64	1.25	±12.1%
1900	40.0	1.40	5.23	5.23	5.23	0.68	1.23	±12.1%
2000	40.0	1.40	4.98	4.98	4.98	0.43	1.60	±12.1%
2300	39.5	1.67	4.90	4.90	4.90	0.90	1.10	±12.1%
2450	39.2	1.80	4.73	4.73	4.73	0.88	1.14	±12.1%
2600	39.0	1.96	4.50	4.50	4.50	0.90	1.10	±12.1%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3293

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	55.5	0.96	6.43	6.43	6.43	0.60	1.25	±12.1%
835	55.2	0.97	6.19	6.19	6.19	0.40	1.60	±12.1%
1750	53.4	1.49	5.05	5.05	5.05	0.66	1.27	±12.1%
1900	53.3	1.52	4.86	4.86	4.86	0.84	1.17	±12.1%
2450	52.7	1.95	4.39	4.39	4.39	0.76	1.31	±12.1%
2600	52.5	2.16	4.16	4.16	4.16	0.90	1.15	±12.1%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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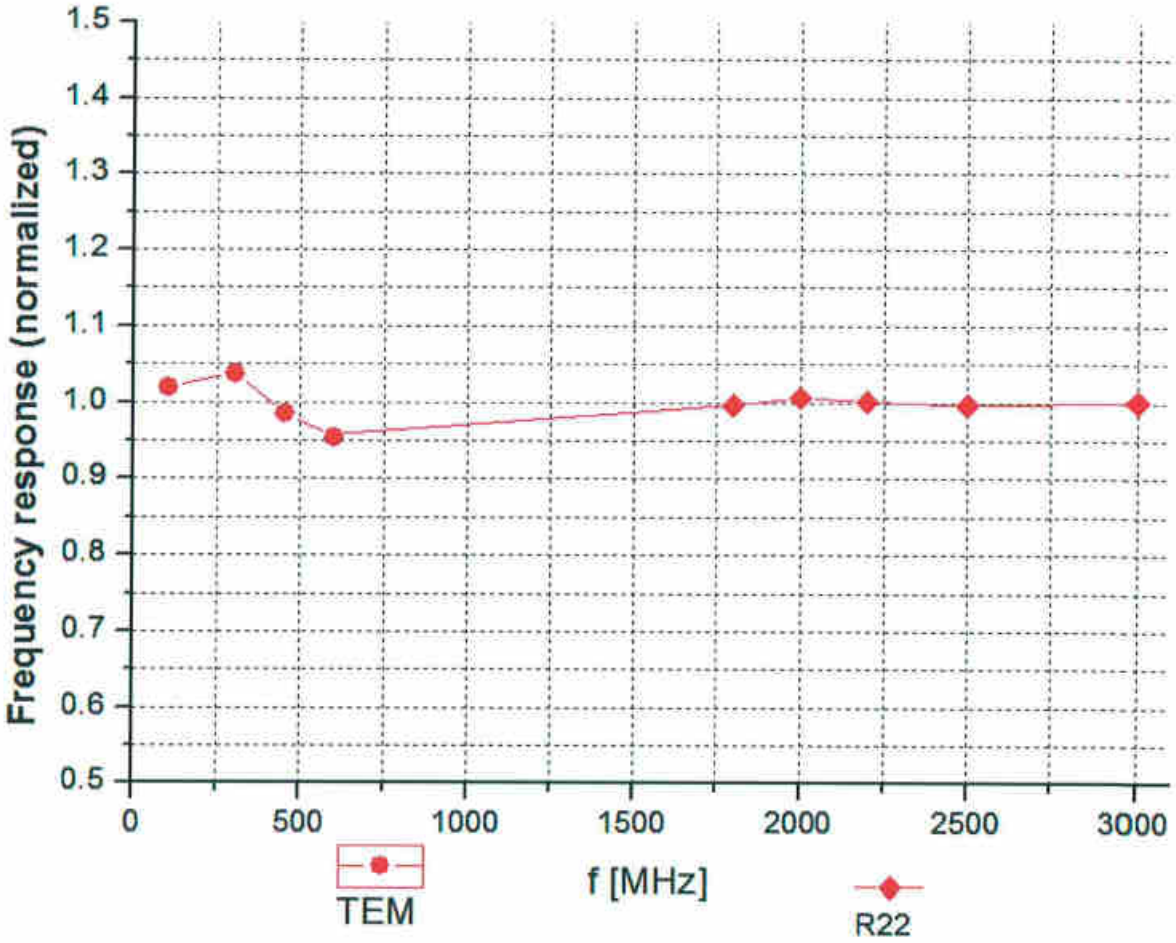
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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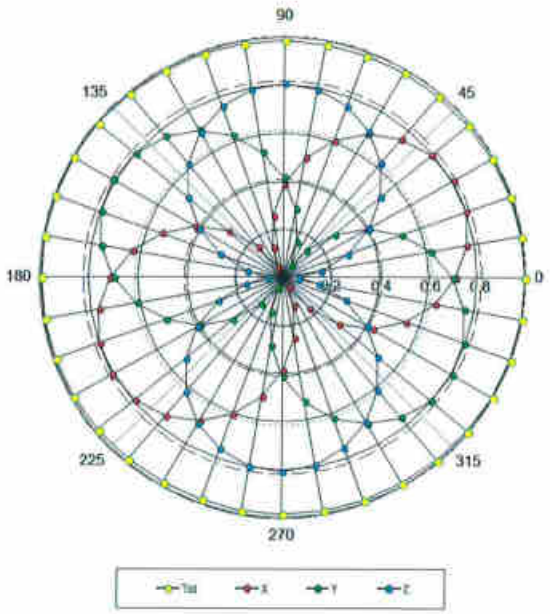
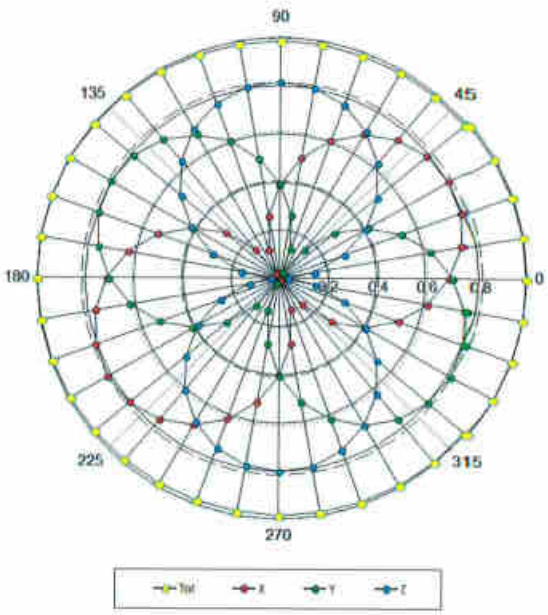
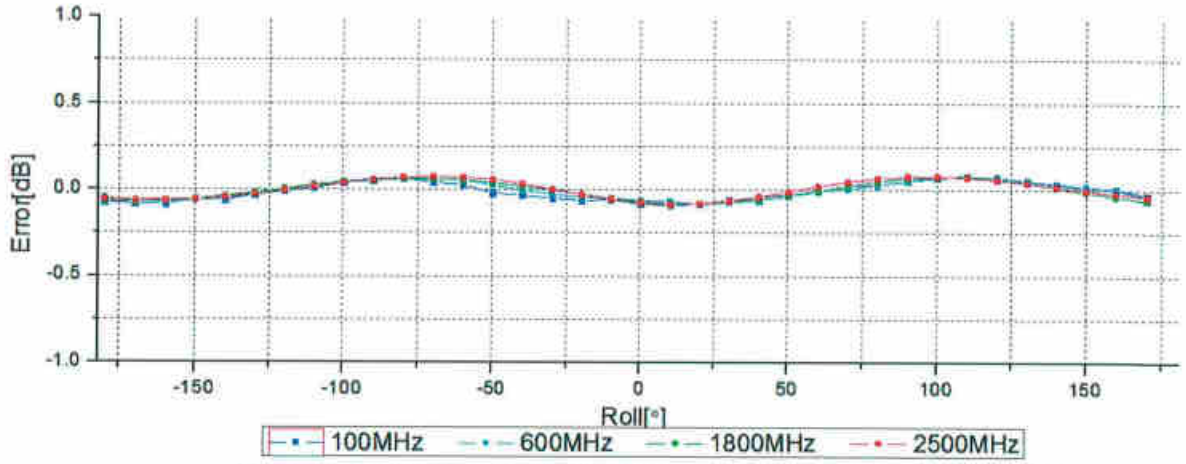
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

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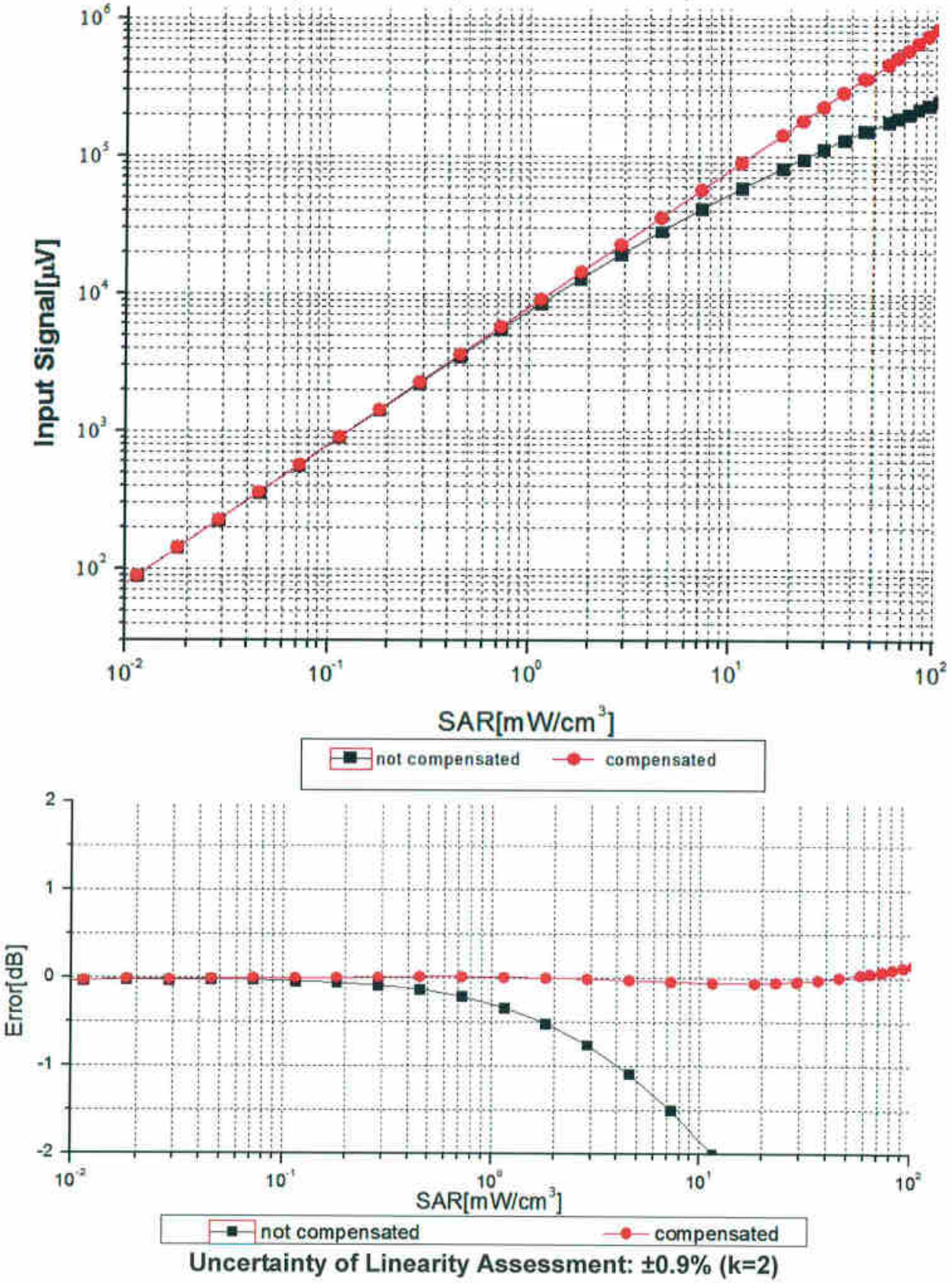
Dynamic Range f(SAR_{head})
(TEM cell, f = 900 MHz)



Uncertainty of Linearity Assessment: ±0.9% (k=2)

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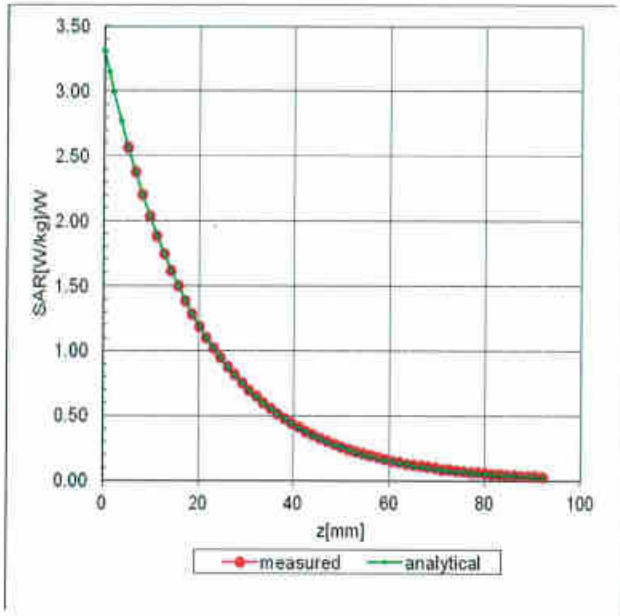
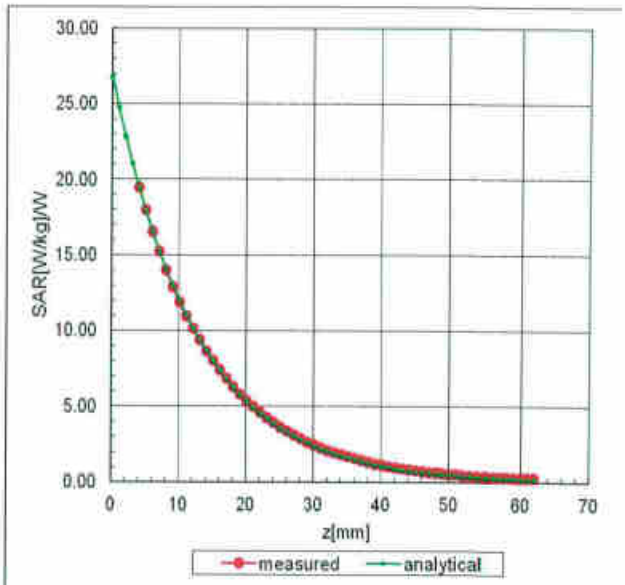
Conversion Factor Assessment

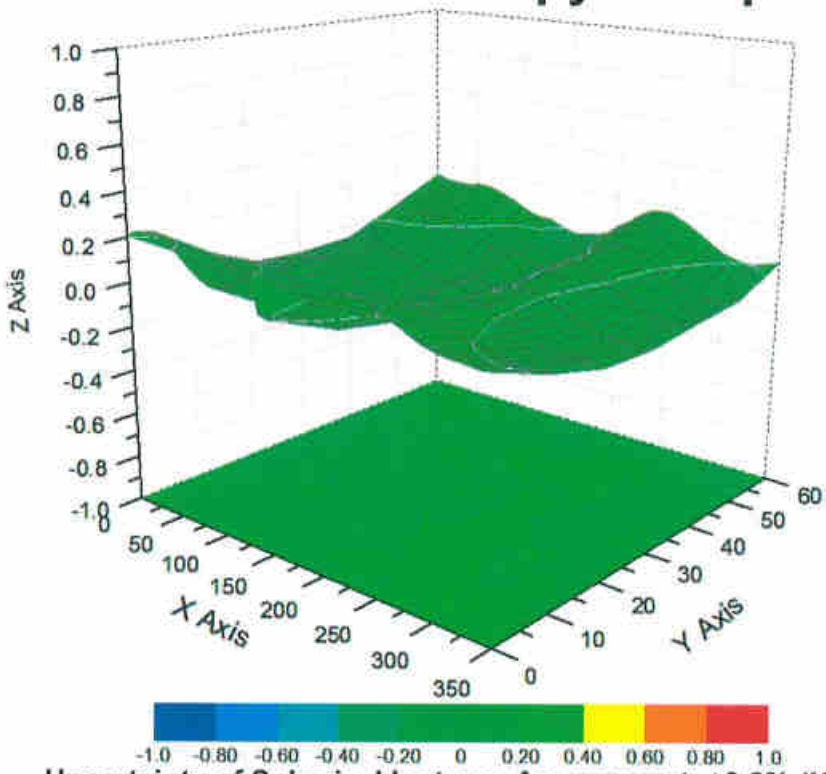
f=835 MHz, WGLS R9(H_convF)



f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (K=2)

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3293

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	7.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	10mm
Tip Diameter	4mm
Probe Tip to Sensor X Calibration Point	2mm
Probe Tip to Sensor Y Calibration Point	2mm
Probe Tip to Sensor Z Calibration Point	2mm
Recommended Measurement Distance from Surface	3mm

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校准
CALIBRATION
CNAS L0570

Client **Auden** **Certificate No: Z17-97052**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3753
Calibration Procedure(s)	FF-Z11-004-01 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	May 05, 2017

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Power sensor NRP-Z91	101547	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Power sensor NRP-Z91	101548	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Reference10dBAttenuator	18N50W-10dB	13-Mar-16(CTTL,No.J16X01547)	Mar-18
Reference20dBAttenuator	18N50W-20dB	13-Mar-16(CTTL, No.J16X01548)	Mar-18
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 549	13-Dec-16(SPEAG, No.DAE4-549_Dec16)	Dec -17
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
SignalGeneratorMG3700A	6201052605	27-Jun-16 (CTTL, No.J16X04776)	Jun-17
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan -18

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: May 06, 2017

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

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) 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 300MHz to 3GHz)", 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"

Methods Applied and Interpretation of Parameters:

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

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Probe EX3DV4

SN: 3753

Calibrated: May 05, 2017

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3753

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)^A	0.47	0.30	0.46	±10.0%
DCP(mV)^B	101.4	107.2	104.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	185.8	±2.0%
		Y	0.0	0.0	1.0		141.4	
		Z	0.0	0.0	1.0		182.6	

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

^{A} The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and Page 6).
^{B} Numerical linearization parameter: uncertainty not required.
^{E} Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3753

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	9.42	9.42	9.42	0.30	0.90	±12.1%
835	41.5	0.90	9.13	9.13	9.13	0.12	1.48	±12.1%
900	41.5	0.97	9.20	9.20	9.20	0.15	1.42	±12.1%
1750	40.1	1.37	8.16	8.16	8.16	0.21	1.12	±12.1%
1900	40.0	1.40	7.79	7.79	7.79	0.21	1.15	±12.1%
2000	40.0	1.40	7.80	7.80	7.80	0.19	1.18	±12.1%
2450	39.2	1.80	7.28	7.28	7.28	0.51	0.77	±12.1%
2600	39.0	1.96	7.20	7.20	7.20	0.61	0.68	±12.1%
3500	37.9	2.91	7.02	7.02	7.02	0.56	0.85	±13.3%
5250	35.9	4.71	5.25	5.25	5.25	0.45	1.20	±13.3%
5600	35.5	5.07	4.75	4.75	4.75	0.45	1.30	±13.3%
5750	35.4	5.22	4.76	4.76	4.76	0.45	1.30	±13.3%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3753

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	55.5	0.96	9.43	9.43	9.43	0.30	0.90	±12.1%
835	55.2	0.97	9.21	9.21	9.21	0.17	1.39	±12.1%
900	55.0	1.05	9.23	9.23	9.23	0.21	1.16	±12.1%
1750	53.4	1.49	7.87	7.87	7.87	0.20	1.19	±12.1%
1900	53.3	1.52	7.58	7.58	7.58	0.17	1.32	±12.1%
2000	53.3	1.52	7.60	7.60	7.60	0.17	1.41	±12.1%
2450	52.7	1.95	7.27	7.27	7.27	0.28	1.46	±12.1%
2600	52.5	2.16	7.14	7.14	7.14	0.31	1.26	±12.1%
3500	51.3	3.31	6.46	6.46	6.46	0.65	0.88	±13.3%
5250	48.9	5.36	4.87	4.87	4.87	0.55	1.20	±13.3%
5600	48.5	5.77	4.27	4.27	4.27	0.55	1.30	±13.3%
5750	48.3	5.94	4.52	4.52	4.52	0.55	1.60	±13.3%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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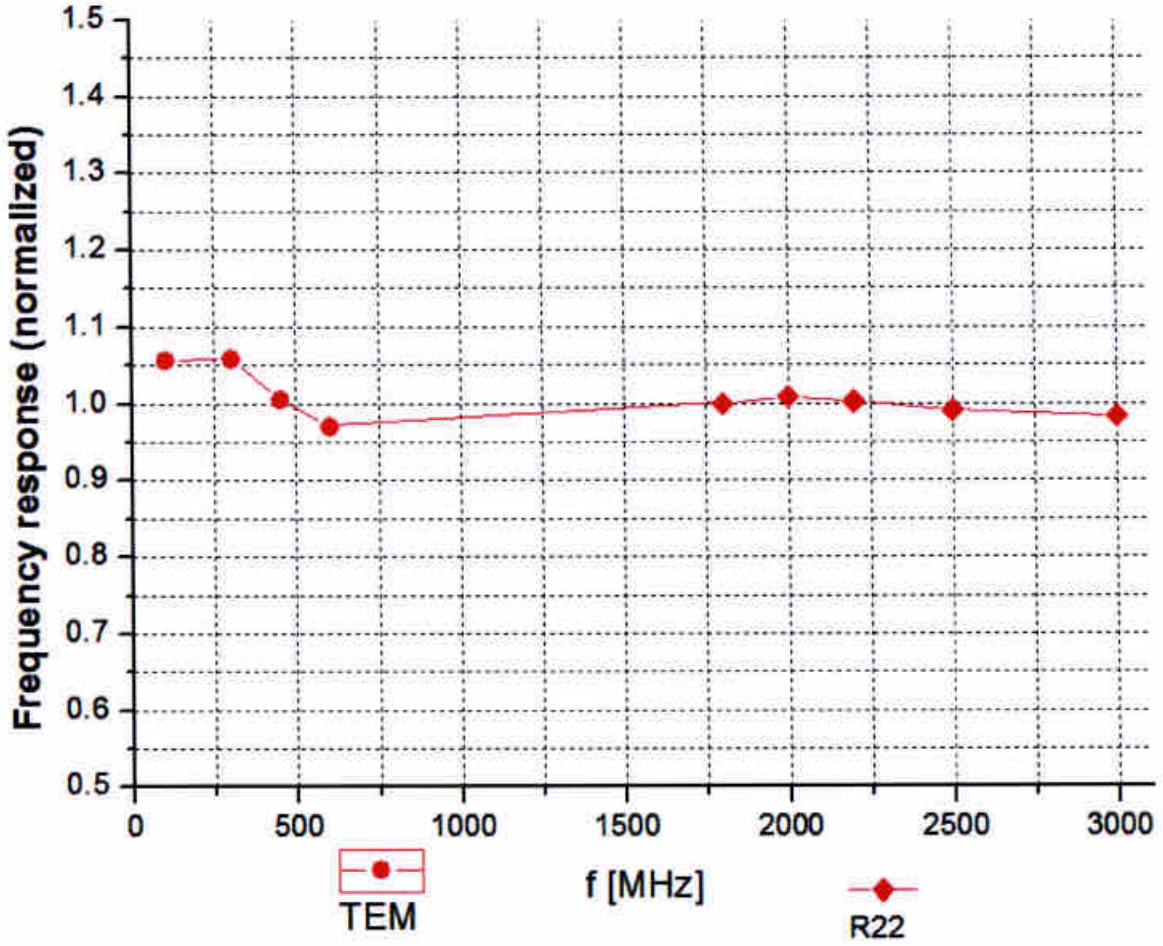
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
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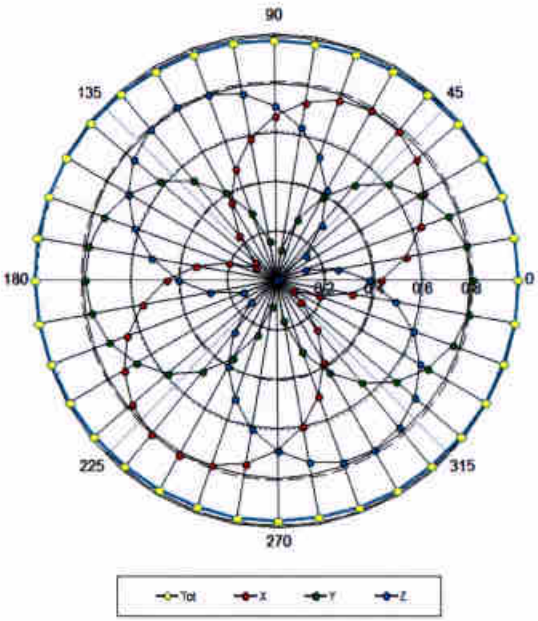
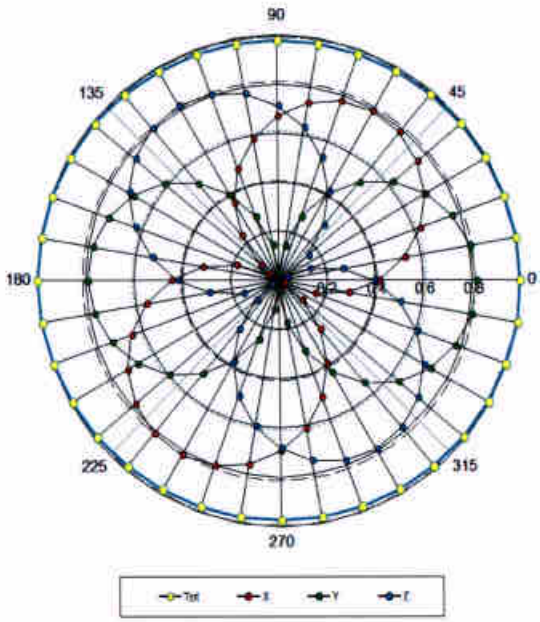
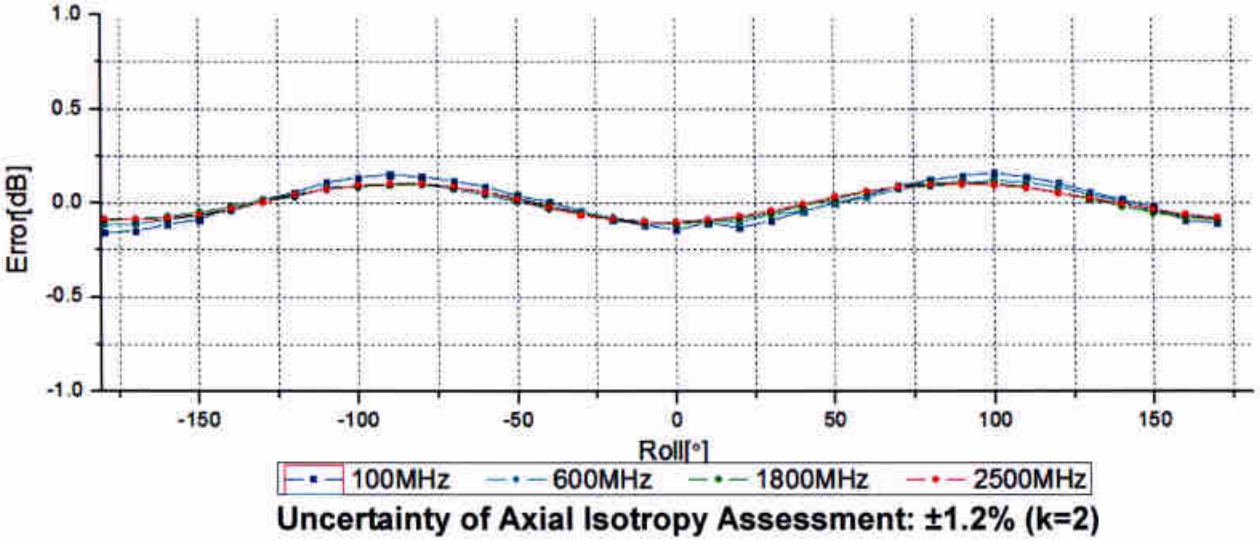
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

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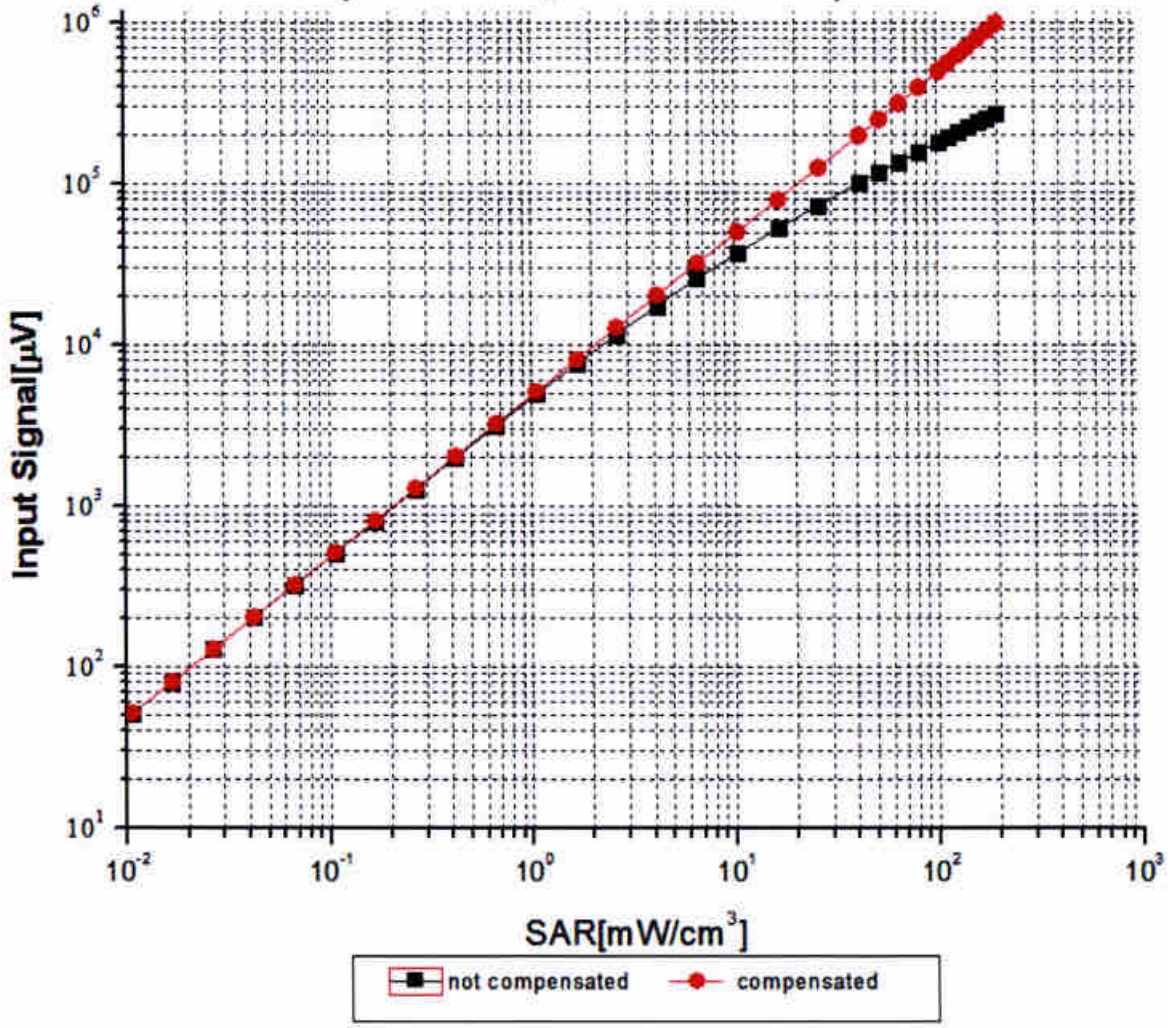
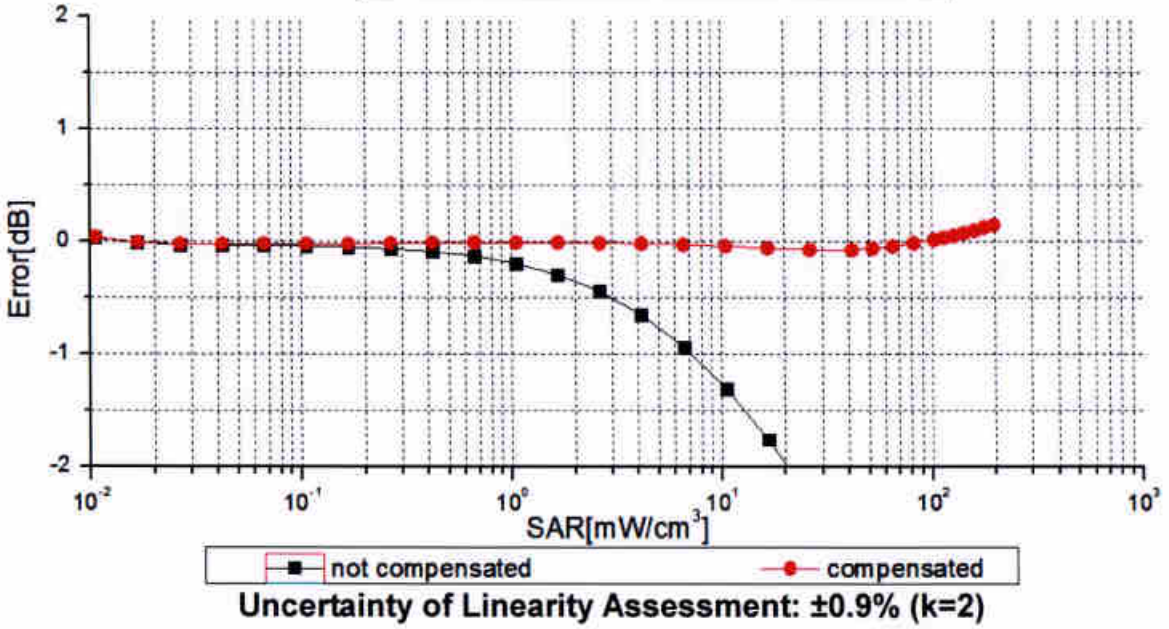
Dynamic Range f(SAR_{head})
(TEM cell, f = 900 MHz)





Uncertainty of Linearity Assessment: ±0.9% (k=2)

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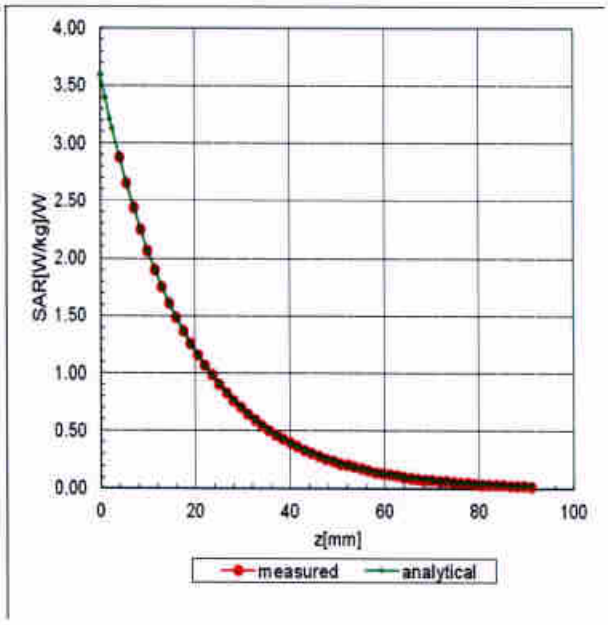
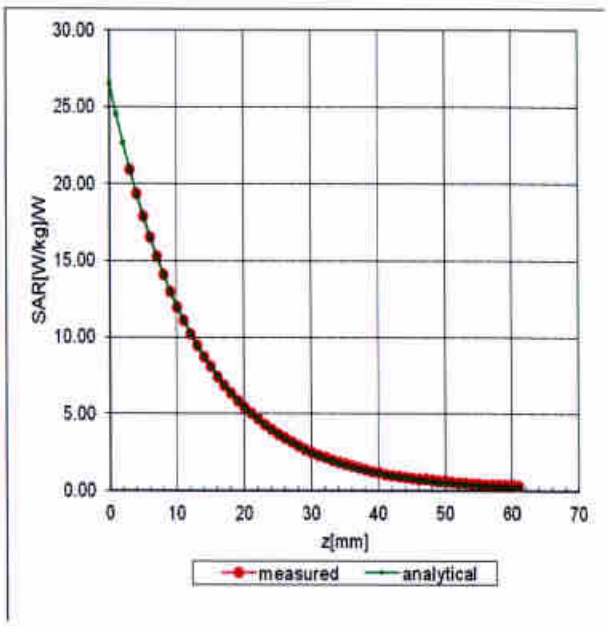
Conversion Factor Assessment

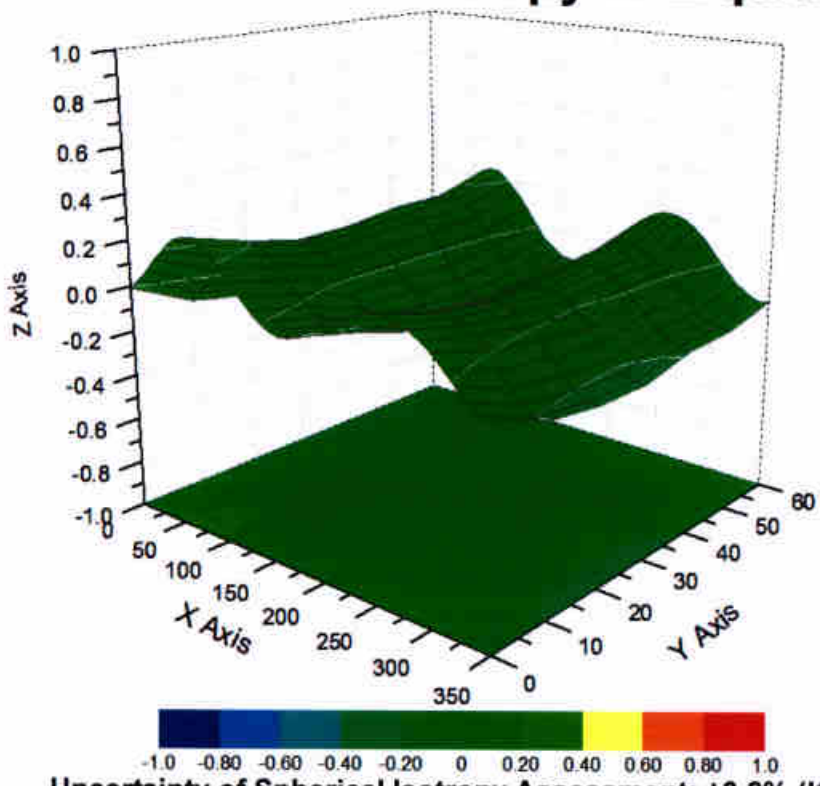
f=900 MHz, WGLS R9(H_convF)



f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (K=2)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN: 3753

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	36.9
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm