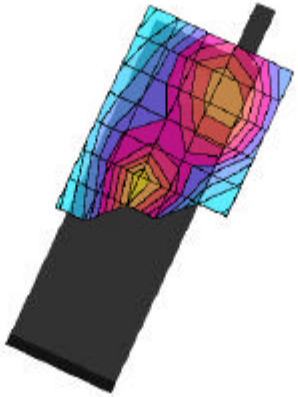
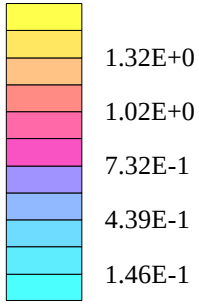
SN#46 Left Head, Channel 991, 5-19-00

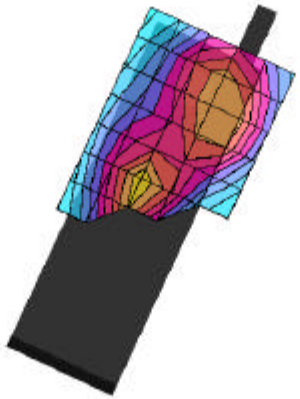
Conducted Pwr = 27.2 dBm
SAR (1g): 1.41 [mW/g] ± 0.04 dB, SAR (10g): 1.01 [mW/g] ± 0.00 dB
Generic Twin Phantom; Left Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 lefthead ch991.DA3
Powerdrift: -0.01 dB

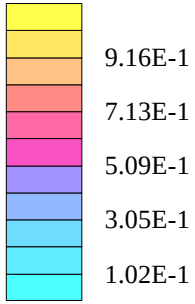




SN#46 Left Head, Channel 383, 5-19-00

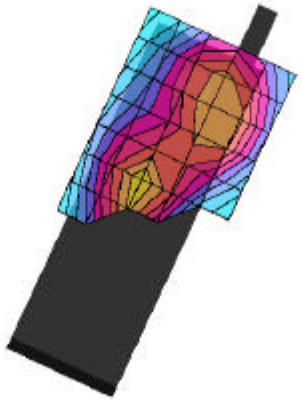
Conducted Pwr = 27.0 dBm
SAR (1g): 1.03 [mW/g] ± 0.04 dB, SAR (10g): 0.748 [mW/g] ± 0.04 dB
Generic Twin Phantom; Left Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 lefthead ch383.DA3
Powerdrift: 0.16 dB

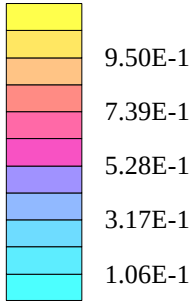




SN#46 Left Head, Channel 799, 5-19-00

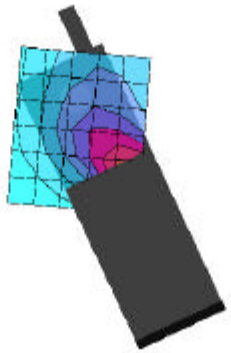
Conducted Pwr = 27.3 dBm
SAR (1g): 1.04 [mW/g] ± 0.03 dB, SAR (10g): 0.769 [mW/g] ± 0.04 dB
Generic Twin Phantom; Left Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 lefthead ch799.DA3
Powerdrift: -0.05 dB

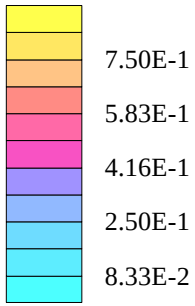




SN#46 Right Head, Channel 991, 5-19-00

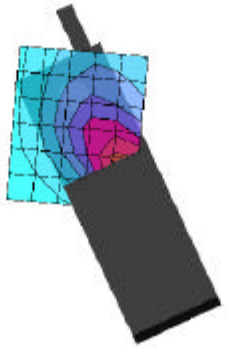
Conducted Pwr = 27.2 dBm
SAR (1g): 1.43 [mW/g] ± 0.02 dB, SAR (10g): 0.983 [mW/g] ± 0.05 dB
Generic Twin Phantom; Right Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 righthead ch991.DA3

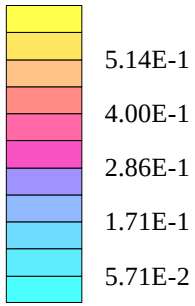




SN#46 Right Head, Channel 383, 5-19-00

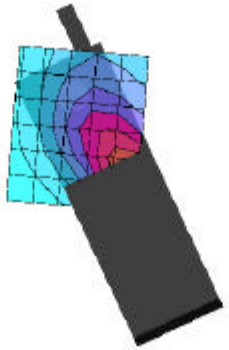
Conducted Pwr = 27.0 dBm
SAR (1g): 0.935 [mW/g] ± 0.20 dB, SAR (10g): 0.659 [mW/g] ± 0.12 dB
Generic Twin Phantom; Right Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 righthead ch383.DA3
Powerdrift: -0.02 dB

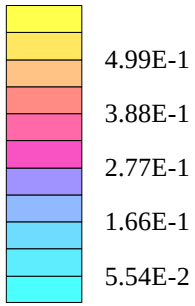




SN#46 Right Head, Channel 799, 5-19-00

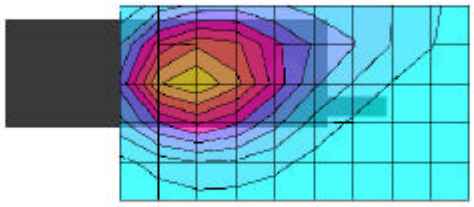
Conducted Pwr = 27.3 dBm
SAR (1g): 0.907 [mW/g] ± 0.20 dB, SAR (10g): 0.637 [mW/g] ± 0.07 dB
Generic Twin Phantom; Right Hand Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 righthead ch799.DA3
Powerdrift: 0.00 dB

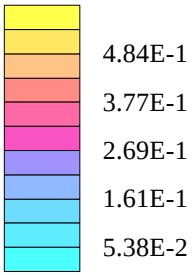




Waist SAR with beltclip and headset. Ch991

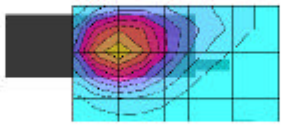
Headset routed along body of phantom to left ear.
Conducted Power = 27.2
SAR (1g): 0.530 [mW/g] ± 0.08 dB, SAR (10g): 0.386 [mW/g] ± 0.08 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.85 [mho/m] ε_r = 41.6 ρ = 1.00 [g/cm^3]
File Name: sn 46 waist ch991.DA3
Powerdrift: -0.03 dB

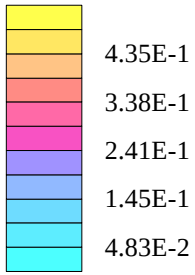




Waist SAR with beltclip and headset. Ch383

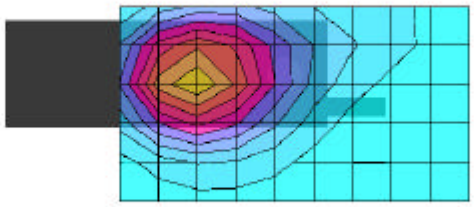
Headset routed along body of phantom to left ear.
Conducted Power = 27.0
SAR (1g): 0.464 [mW/g] ± 0.13 dB, SAR (10g): 0.339 [mW/g] ± 0.12 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.85 [mho/m] ε_r = 41.6 ρ = 1.00 [g/cm^3]
File Name: sn 46 waist ch383.DA3
Powerdrift: -0.05 dB

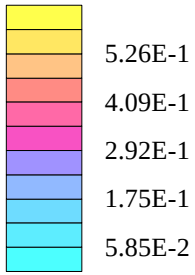




Waist SAR with beltclip and headset. Ch799

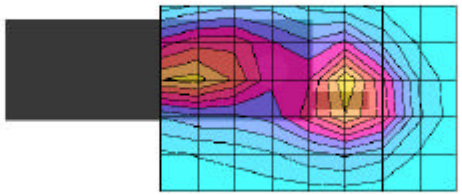
Headset routed along body of phantom to left ear.
Conducted Power = 27.2
SAR (1g): 0.561 [mW/g] ± 0.08 dB, SAR (10g): 0.410 [mW/g] ± 0.09 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.85 [mho/m] ε_r = 41.6 ρ = 1.00 [g/cm^3]
File Name: sn 46 waist ch799.DA3
Powerdrift: 0.03 dB

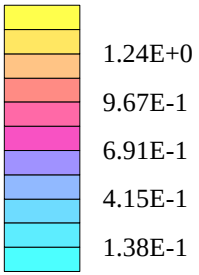




Push-To-Talk Position. Ch991

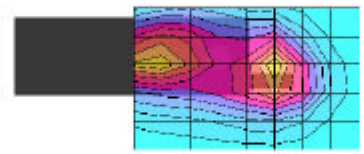
Phone parallel with flat phantom. 0.25 in seperation between phatom and phone
Conducted Power = 27.2
SAR (1g): 1.33 [mW/g] ± 0.25 dB, SAR (10g): 0.905 [mW/g] ± 0.25 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 push-to-talk ch991.DA3
Powerdrift: -0.03 dB

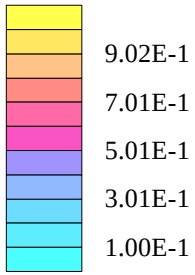




Push-To-Talk Position. Ch383

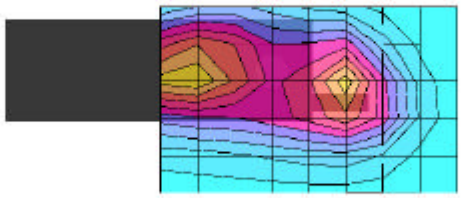
Phone parallel with flat phantom. 0.25 in seperation between phatom and phone
Conducted Power = 27.0
SAR (1g): 0.944 [mW/g] ± 0.21 dB, SAR (10g): 0.642 [mW/g] ± 0.21 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 push-to-talk ch383.DA3
Powerdrift: 0.19 dB

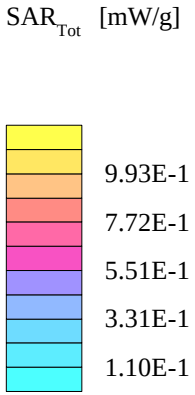




Push-To-Talk Position. Ch799

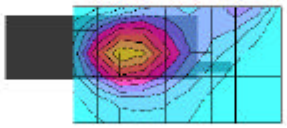
Phone parallel with flat phantom. 0.25 in seperation between phatom and phone
Conducted Power = 27.3
SAR (1g): 1.08 [mW/g] ± 0.20 dB, SAR (10g): 0.792 [mW/g] ± 0.21 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: sn46 push-to-talk ch799.DA3
Powerdrift: -0.04 dB

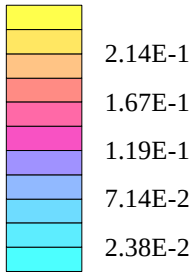




Waist SAR with beltclip and headset. Muscle dielectric. Ch991

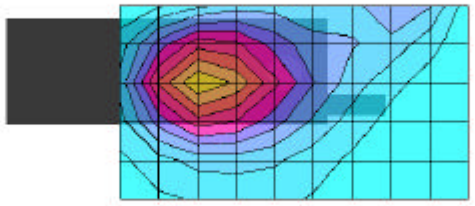
Headset routed along body of phantom to left ear.
Conducted Power = 27.2
SAR (1g): 0.230 [mW/g] ± 0.24 dB, SAR (10g): 0.169 [mW/g] ± 0.25 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.93 [mho/m] ε_r = 55.1 ρ = 1.00 [g/cm^3]
File Name: sn 46 waiste muscle ch991.DA3
Powerdrift: -0.08 dB

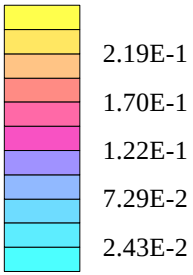




Waist SAR with beltclip and headset. Muscle dielectric. Ch383

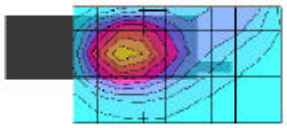
Headset routed along body of phantom to left ear.
Conducted Power = 27.0
SAR (1g): 0.231 [mW/g] ± 0.19 dB, SAR (10g): 0.169 [mW/g] ± 0.22 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.93 [mho/m] ε_r = 55.1 ρ = 1.00 [g/cm^3]
File Name: sn 46 waiste muscle ch383.DA3
Powerdrift: 0.19 dB

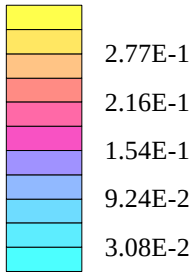




Waist SAR with beltclip and headset. Muscle dielectric. Ch799

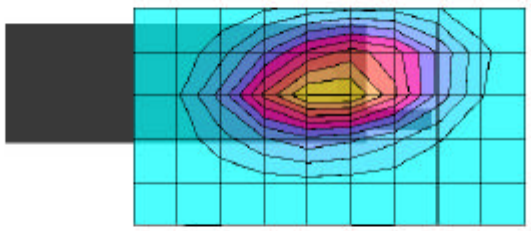
Headset routed along body of phantom to left ear.
Conducted Power = 27.2
SAR (1g): 0.293 [mW/g] ± 0.18 dB, SAR (10g): 0.215 [mW/g] ± 0.19 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.93 [mho/m] ε_r = 55.1 ρ = 1.00 [g/cm^3]
File Name: sn 46 waiste muscle ch799.DA3
Powerdrift: 0.06 dB

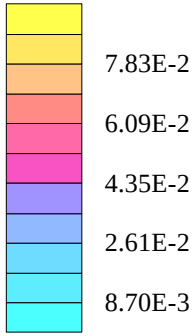




900 MHz validation 6/23/00

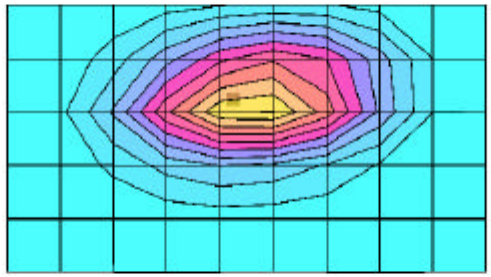
SAR (1g): 0.0910 [mW/g] ± 0.19 dB, SAR (10g): 0.0598 [mW/g] ± 0.18 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.85 [mho/m] ε_r = 41.6 ρ = 1.00 [g/cm^3]
File Name: 900 validation.DA3
Powerdrift: 0.04 dB

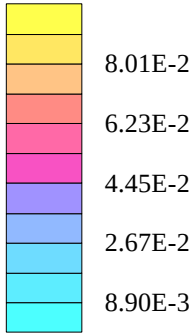




900 MHz Muscle Validation 6-23-00

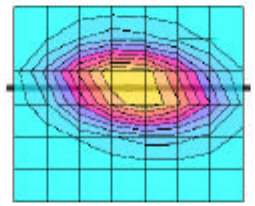
SAR (1g): 0.0922 [mW/g] ± 0.23 dB, SAR (10g): 0.0605 [mW/g] ± 0.21 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900MHz: σ = 0.93 [mho/m] ε_r = 55.1 ρ = 1.00 [g/cm^3]
File Name: 900 muscle validation.DA3
Powerdrift: 0.03 dB

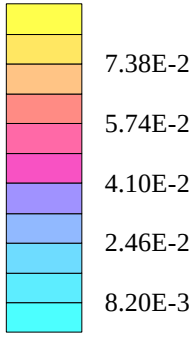




900 MHz Validation 5-19-00

SAR (1g): 0.0925 [mW/g] ± 0.26 dB, SAR (10g): 0.0608 [mW/g] ± 0.26 dB
Generic Twin Phantom; Flat Section
Probe: ET3DV5 - SN1348; ConvF(5.90,5.90,5.90)
Brain 900 MHz: σ = 0.85 [mho/m] ε_r = 43.4 ρ = 1.00 [g/cm^3]
File Name: ValidationFlat900MHz 5-18-00.DA3
Powerdrift: -0.07 dB





Reference math : OFF Title: 6-22-00

Pt#	Frequency (GHz)	Data real	Data imag
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2	0.114500000	56.66	26.88
3	0.129000000	56.22	25.33
4	0.143500000	55.62	24.03
5	0.158000000	55.19	22.94
6	0.172500000	54.82	21.75
7	0.187000000	54.21	21.35
8	0.201500000	53.77	20.59
9	0.216000000	53.32	20.14
10	0.230500000	53.06	19.68
11	0.245000000	52.61	19.35
12	0.259500000	52.10	18.90
13	0.274000000	51.72	18.72
14	0.288500000	51.51	18.56
15	0.303000000	50.99	18.35
16	0.317500000	50.73	18.15
17	0.332000000	50.43	17.99
18	0.346500000	50.25	17.86
19	0.361000000	49.90	17.73
20	0.375500000	49.56	17.64
21	0.390000000	49.34	17.54
22	0.404500000	49.00	17.46
23	0.419000000	48.73	17.49
24	0.433500000	48.58	17.40
25	0.448000000	48.26	17.19
26	0.462500000	47.87	17.31
27	0.477000000	47.67	17.26
28	0.491500000	47.40	17.20
29	0.506000000	47.08	17.11
30	0.520500000	46.89	17.11
31	0.535000000	46.69	17.08
32	0.549500000	46.46	17.18
33	0.564000000	46.21	17.11
34	0.578500000	46.05	17.05
35	0.593000000	45.78	17.08
36	0.607500000	45.50	17.05
37	0.622000000	45.26	17.00
38	0.636500000	45.07	16.94
39	0.651000000	44.85	17.04
40	0.665500000	44.68	17.03
41	0.680000000	44.44	17.01
42	0.694500000	44.24	16.99
43	0.709000000	44.03	17.00
44	0.723500000	43.85	17.03
45	0.738000000	43.70	17.01
46	0.752500000	43.50	17.12
47	0.767000000	43.27	17.21
48	0.781500000	43.09	17.16
49	0.796000000	42.87	17.17
50	0.810500000	42.65	17.16
51	0.825000000	42.49	17.15
52	0.839500000	42.28	17.11
53	0.854000000	42.15	17.14

900MHz validation
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54	0.868500000	41.97	17.10
55	0.883000000	41.85	17.12
56	0.897500000	41.73	17.06
57	0.912000000	41.58	17.06
58	0.926500000	41.42	17.04
59	0.941000000	41.27	17.07
60	0.955500000	41.07	17.07
61	0.970000000	40.87	17.07
62	0.984500000	40.69	17.07
63	0.999000000	40.55	17.09
64	1.013500000	40.41	17.10
65	1.028000000	40.34	17.10
66	1.042500000	40.20	17.11
67	1.057000000	40.05	17.08
68	1.071500000	39.88	17.09
69	1.086000000	39.72	17.09
70	1.100500000	39.57	17.09
71	1.115000000	39.40	17.09
72	1.129500000	39.22	17.09
73	1.144000000	39.10	17.09
74	1.158500000	38.97	17.11
75	1.173000000	38.89	17.10
76	1.187500000	38.80	17.13
77	1.202000000	38.66	17.10
78	1.216500000	38.54	17.13
79	1.231000000	38.40	17.10
80	1.245500000	38.25	17.07
81	1.260000000	38.12	17.05
82	1.274500000	38.01	17.07
83	1.289000000	37.86	17.08
84	1.303500000	37.78	17.11
85	1.318000000	37.64	17.06
86	1.332500000	37.58	17.07
87	1.347000000	37.46	17.09
88	1.361500000	37.34	17.11
89	1.376000000	37.22	17.11
90	1.390500000	37.10	17.08
91	1.405000000	36.97	17.08
92	1.419500000	36.83	17.10
93	1.434000000	36.68	17.09
94	1.448500000	36.56	17.08
95	1.463000000	36.44	17.05
96	1.477500000	36.34	17.10
97	1.492000000	36.28	17.06
98	1.506500000	36.18	17.04
99	1.521000000	36.12	17.00
100	1.535500000	36.00	16.99
101	1.550000000	35.91	16.97
102	1.564500000	35.83	16.98
103	1.579000000	35.67	17.00
104	1.593500000	35.56	17.00
105	1.608000000	35.46	17.01
106	1.622500000	35.45	17.05
107	1.637000000	35.32	17.06
108	1.651500000	35.22	17.05
109	1.666000000	35.13	17.07
110	1.680500000	35.04	17.06

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111	1.695000000	34.94	17.05
112	1.709500000	34.82	17.04
113	1.724000000	34.69	17.02
114	1.738500000	34.55	17.04
115	1.753000000	34.47	17.03
116	1.767500000	34.39	17.01
117	1.782000000	34.31	17.03
118	1.796500000	34.26	17.04
119	1.811000000	34.15	17.00
120	1.825500000	34.05	16.98
121	1.840000000	33.96	16.96
122	1.854500000	33.86	16.97
123	1.869000000	33.80	16.98
124	1.883500000	33.69	16.94
125	1.898000000	33.62	16.94
126	1.912500000	33.53	16.94
127	1.927000000	33.45	16.94
128	1.941500000	33.40	16.95
129	1.956000000	33.31	16.95
130	1.970500000	33.24	16.95
131	1.985000000	33.17	16.94
132	1.999500000	33.09	16.94
133	2.014000000	32.98	16.94
134	2.028500000	32.91	16.92
135	2.043000000	32.80	16.96
136	2.057500000	32.69	16.93
137	2.072000000	32.61	16.92
138	2.086500000	32.54	16.92
139	2.101000000	32.47	16.93
140	2.115500000	32.39	16.90
141	2.130000000	32.32	16.88
142	2.144500000	32.25	16.87
143	2.159000000	32.18	16.83
144	2.173500000	32.08	16.85
145	2.188000000	32.03	16.82
146	2.202500000	31.96	16.85
147	2.217000000	31.89	16.84
148	2.231500000	31.81	16.83
149	2.246000000	31.75	16.83
150	2.260500000	31.68	16.80
151	2.275000000	31.65	16.82
152	2.289500000	31.59	16.81
153	2.304000000	31.53	16.83
154	2.318500000	31.45	16.82
155	2.333000000	31.38	16.82
156	2.347500000	31.29	16.81
157	2.362000000	31.22	16.82
158	2.376500000	31.16	16.80
159	2.391000000	31.10	16.83
160	2.405500000	30.99	16.84
161	2.420000000	30.93	16.86
162	2.434500000	30.87	16.86
163	2.449000000	30.79	16.84
164	2.463500000	30.75	16.83
165	2.478000000	30.67	16.83
166	2.492500000	30.63	16.81
167	2.507000000	30.56	16.81

900MHz validation 6-22-00

Reference math : OFF Title: 6-22-00

Pt#	Frequency (GHz)	Data real	Data imag
1	0.100000000	65.78	63.23
2	0.114500000	65.32	55.92
3	0.129000000	64.95	50.65
4	0.143500000	64.44	46.15
5	0.158000000	63.83	42.53
6	0.172500000	63.71	39.63
7	0.187000000	63.44	37.46
8	0.201500000	63.47	35.45
9	0.216000000	63.20	33.60
10	0.230500000	62.90	32.10
11	0.245000000	62.48	30.71
12	0.259500000	62.23	29.48
13	0.274000000	62.00	28.50
14	0.288500000	62.04	27.66
15	0.303000000	61.81	26.95
16	0.317500000	61.52	26.20
17	0.332000000	61.30	25.42
18	0.346500000	61.17	24.83
19	0.361000000	61.00	24.34
20	0.375500000	60.86	23.87
21	0.390000000	60.82	23.54
22	0.404500000	60.58	23.01
23	0.419000000	60.43	22.63
24	0.433500000	60.17	22.17
25	0.448000000	60.03	21.79
26	0.462500000	59.87	21.72
27	0.477000000	59.77	21.51
28	0.491500000	59.59	21.27
29	0.506000000	59.28	20.99
30	0.520500000	59.14	20.70
31	0.535000000	58.99	20.51
32	0.549500000	58.89	20.41
33	0.564000000	58.85	20.31
34	0.578500000	58.71	20.15
35	0.593000000	58.56	20.05
36	0.607500000	58.40	19.82
37	0.622000000	58.15	19.65
38	0.636500000	57.99	19.50
39	0.651000000	57.87	19.54
40	0.665500000	57.72	19.47
41	0.680000000	57.61	19.44
42	0.694500000	57.49	19.28
43	0.709000000	57.29	19.18
44	0.723500000	57.19	19.11
45	0.738000000	57.07	19.06
46	0.752500000	56.94	19.10
47	0.767000000	56.85	19.17
48	0.781500000	56.73	19.12
49	0.796000000	56.61	19.03
50	0.810500000	56.40	18.96
51	0.825000000	56.26	18.91
52	0.839500000	56.04	18.86
53	0.854000000	55.98	18.85

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54	0.868500000	55.90	18.85
55	0.883000000	55.86	18.79
56	0.897500000	55.75	18.67
57	0.912000000	55.69	18.64
58	0.926500000	55.52	18.61
59	0.941000000	55.37	18.67
60	0.955500000	55.24	18.66
61	0.970000000	55.08	18.63
62	0.984500000	54.99	18.64
63	0.999000000	54.93	18.59
64	1.013500000	54.82	18.56
65	1.028000000	54.68	18.61
66	1.042500000	54.56	18.62
67	1.057000000	54.48	18.63
68	1.071500000	54.37	18.61
69	1.086000000	54.23	18.62
70	1.100500000	54.15	18.59
71	1.115000000	53.94	18.57
72	1.129500000	53.78	18.58
73	1.144000000	53.70	18.58
74	1.158500000	53.67	18.61
75	1.173000000	53.63	18.64
76	1.187500000	53.59	18.63
77	1.202000000	53.43	18.59
78	1.216500000	53.29	18.62
79	1.231000000	53.16	18.62
80	1.245500000	53.05	18.63
81	1.260000000	52.95	18.62
82	1.274500000	52.93	18.61
83	1.289000000	52.80	18.61
84	1.303500000	52.68	18.61
85	1.318000000	52.55	18.59
86	1.332500000	52.50	18.65
87	1.347000000	52.47	18.72
88	1.361500000	52.43	18.73
89	1.376000000	52.33	18.77
90	1.390500000	52.19	18.76
91	1.405000000	51.99	18.72
92	1.419500000	51.82	18.76
93	1.434000000	51.71	18.76
94	1.448500000	51.64	18.81
95	1.463000000	51.60	18.82
96	1.477500000	51.53	18.84
97	1.492000000	51.45	18.80
98	1.506500000	51.30	18.77
99	1.521000000	51.25	18.75
100	1.535500000	51.16	18.78
101	1.550000000	51.10	18.82
102	1.564500000	51.07	18.83
103	1.579000000	50.93	18.83
104	1.593500000	50.83	18.80
105	1.608000000	50.73	18.84
106	1.622500000	50.68	18.91
107	1.637000000	50.62	19.00
108	1.651500000	50.54	19.04
109	1.666000000	50.46	19.06
110	1.680500000	50.39	19.05

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111	1.695000000	50.26	19.01
112	1.709500000	50.15	19.02
113	1.724000000	49.99	19.10
114	1.738500000	49.91	19.14
115	1.753000000	49.86	19.17
116	1.767500000	49.77	19.15
117	1.782000000	49.71	19.13
118	1.796500000	49.61	19.13
119	1.811000000	49.53	19.13
120	1.825500000	49.40	19.21
121	1.840000000	49.31	19.22
122	1.854500000	49.27	19.20
123	1.869000000	49.21	19.20
124	1.883500000	49.12	19.16
125	1.898000000	49.03	19.17
126	1.912500000	48.92	19.22
127	1.927000000	48.87	19.27
128	1.941500000	48.82	19.34
129	1.956000000	48.77	19.33
130	1.970500000	48.69	19.30
131	1.985000000	48.65	19.30
132	1.999500000	48.53	19.30
133	2.014000000	48.43	19.39
134	2.028500000	48.35	19.41
135	2.043000000	48.27	19.43
136	2.057500000	48.21	19.45
137	2.072000000	48.13	19.43
138	2.086500000	48.02	19.43
139	2.101000000	47.91	19.46
140	2.115500000	47.84	19.50
141	2.130000000	47.79	19.52
142	2.144500000	47.75	19.52
143	2.159000000	47.69	19.48
144	2.173500000	47.59	19.45
145	2.188000000	47.49	19.44
146	2.202500000	47.36	19.51
147	2.217000000	47.31	19.55
148	2.231500000	47.30	19.59
149	2.246000000	47.28	19.60
150	2.260500000	47.22	19.56
151	2.275000000	47.16	19.58
152	2.289500000	47.08	19.56
153	2.304000000	46.98	19.63
154	2.318500000	46.87	19.70
155	2.333000000	46.85	19.74
156	2.347500000	46.84	19.75
157	2.362000000	46.76	19.73
158	2.376500000	46.66	19.68
159	2.391000000	46.53	19.77
160	2.405500000	46.43	19.83
161	2.420000000	46.36	19.88
162	2.434500000	46.34	19.91
163	2.449000000	46.33	19.90
164	2.463500000	46.25	19.94
165	2.478000000	46.19	19.86
166	2.492500000	46.07	19.85
167	2.507000000	45.95	19.90

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168	2.521500000	45.88	19.97
169	2.536000000	45.84	20.03
170	2.550500000	45.86	20.05
171	2.565000000	45.78	20.07
172	2.579500000	45.72	20.03
173	2.594000000	45.61	20.03
174	2.608500000	45.49	20.12
175	2.623000000	45.41	20.19
176	2.637500000	45.38	20.19
177	2.652000000	45.32	20.29
178	2.666500000	45.26	20.26
179	2.681000000	45.15	20.22
180	2.695500000	45.02	20.22
181	2.710000000	44.96	20.25
182	2.724500000	44.86	20.32
183	2.739000000	44.83	20.44
184	2.753500000	44.77	20.42
185	2.768000000	44.73	20.39
186	2.782500000	44.62	20.37
187	2.797000000	44.53	20.35
188	2.811500000	44.42	20.46
189	2.826000000	44.38	20.51
190	2.840500000	44.31	20.53
191	2.855000000	44.25	20.51
192	2.869500000	44.17	20.49
193	2.884000000	44.09	20.49
194	2.898500000	44.02	20.52
195	2.913000000	43.95	20.60
196	2.927500000	43.91	20.65
197	2.942000000	43.85	20.65
198	2.956500000	43.77	20.60
199	2.971000000	43.68	20.56
200	2.985500000	43.54	20.59
201	3.000000000	43.49	20.62

900MHz muscle validation 6-22-00

Reference math : OFF Title: 5-18-00

Pt#	Frequency (GHz)	Data real	Data imag
1	0.100000000	58.31	31.07
2	0.114500000	57.61	28.60
3	0.129000000	57.06	26.63
4	0.143500000	56.41	24.88
5	0.158000000	55.92	23.75
6	0.172500000	55.56	22.75
7	0.187000000	55.11	21.97
8	0.201500000	54.74	21.24
9	0.216000000	54.32	20.61
10	0.230500000	53.88	20.00
11	0.245000000	53.55	19.69
12	0.259500000	53.11	19.31
13	0.274000000	52.92	18.94
14	0.288500000	52.54	18.67
15	0.303000000	52.25	18.55
16	0.317500000	51.89	18.26
17	0.332000000	51.59	18.11
18	0.346500000	51.41	17.97
19	0.361000000	51.05	17.84
20	0.375500000	50.72	17.65
21	0.390000000	50.51	17.55
22	0.404500000	50.20	17.48
23	0.419000000	50.03	17.42
24	0.433500000	49.65	17.36
25	0.448000000	49.44	17.24
26	0.462500000	49.27	17.23
27	0.477000000	48.98	17.15
28	0.491500000	48.71	17.07
29	0.506000000	48.51	17.01
30	0.520500000	48.33	16.99
31	0.535000000	48.07	17.01
32	0.549500000	47.89	17.01
33	0.564000000	47.63	16.94
34	0.578500000	47.42	16.89
35	0.593000000	47.24	16.89
36	0.607500000	46.97	16.87
37	0.622000000	46.74	16.85
38	0.636500000	46.57	16.85
39	0.651000000	46.35	16.85
40	0.665500000	46.17	16.87
41	0.680000000	45.99	16.86
42	0.694500000	45.73	16.84
43	0.709000000	45.55	16.84
44	0.723500000	45.43	16.87
45	0.738000000	45.22	16.83
46	0.752500000	45.03	16.86
47	0.767000000	44.87	16.90
48	0.781500000	44.70	16.83
49	0.796000000	44.50	16.88
50	0.810500000	44.34	16.87
51	0.825000000	44.17	16.92
52	0.839500000	43.97	16.87
53	0.854000000	43.78	16.89

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54	0.868500000	43.64	16.89
55	0.883000000	43.49	16.91
56	0.897500000	43.36	16.92
57	0.912000000	43.16	16.93
58	0.926500000	43.02	16.92
59	0.941000000	42.85	16.90
60	0.955500000	42.70	16.92
61	0.970000000	42.55	16.94
62	0.984500000	42.38	16.95
63	0.999000000	42.25	16.94
64	1.013500000	42.06	16.97
65	1.028000000	41.96	16.95
66	1.042500000	41.82	16.97
67	1.057000000	41.65	16.98
68	1.071500000	41.50	17.00
69	1.086000000	41.35	16.99
70	1.100500000	41.25	16.98
71	1.115000000	41.06	17.03
72	1.129500000	40.95	17.02
73	1.144000000	40.80	17.01
74	1.158500000	40.67	17.02
75	1.173000000	40.54	17.03
76	1.187500000	40.43	17.04
77	1.202000000	40.29	17.04
78	1.216500000	40.18	17.03
79	1.231000000	40.09	17.04
80	1.245500000	39.94	17.04
81	1.260000000	39.82	17.07
82	1.274500000	39.68	17.10
83	1.289000000	39.56	17.07
84	1.303500000	39.44	17.10
85	1.318000000	39.32	17.10
86	1.332500000	39.20	17.10
87	1.347000000	39.05	17.12
88	1.361500000	38.91	17.11
89	1.376000000	38.81	17.12
90	1.390500000	38.70	17.12
91	1.405000000	38.60	17.12
92	1.419500000	38.46	17.13
93	1.434000000	38.32	17.10
94	1.448500000	38.22	17.13
95	1.463000000	38.11	17.11
96	1.477500000	38.00	17.12
97	1.492000000	37.91	17.09
98	1.506500000	37.81	17.09
99	1.521000000	37.74	17.08
100	1.535500000	37.61	17.11
101	1.550000000	37.54	17.12
102	1.564500000	37.45	17.12
103	1.579000000	37.31	17.13
104	1.593500000	37.23	17.13
105	1.608000000	37.12	17.13
106	1.622500000	37.02	17.13
107	1.637000000	36.93	17.15
108	1.651500000	36.81	17.13
109	1.666000000	36.70	17.17
110	1.680500000	36.62	17.15

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111	1.695000000	36.52	17.13
112	1.709500000	36.41	17.14
113	1.724000000	36.30	17.13
114	1.738500000	36.23	17.13
115	1.753000000	36.11	17.14
116	1.767500000	36.05	17.15
117	1.782000000	35.94	17.12
118	1.796500000	35.87	17.10
119	1.811000000	35.78	17.10
120	1.825500000	35.68	17.13
121	1.840000000	35.61	17.11
122	1.854500000	35.53	17.12
123	1.869000000	35.43	17.12
124	1.883500000	35.37	17.11
125	1.898000000	35.27	17.12
126	1.912500000	35.18	17.14
127	1.927000000	35.05	17.11
128	1.941500000	35.00	17.13
129	1.956000000	34.90	17.11
130	1.970500000	34.84	17.11
131	1.985000000	34.74	17.11
132	1.999500000	34.67	17.10
133	2.014000000	34.59	17.10
134	2.028500000	34.49	17.08
135	2.043000000	34.41	17.09
136	2.057500000	34.32	17.08
137	2.072000000	34.27	17.07
138	2.086500000	34.20	17.08
139	2.101000000	34.13	17.07
140	2.115500000	34.05	17.08
141	2.130000000	33.96	17.09
142	2.144500000	33.90	17.08
143	2.159000000	33.83	17.08
144	2.173500000	33.76	17.08
145	2.188000000	33.69	17.11
146	2.202500000	33.61	17.09
147	2.217000000	33.50	17.13
148	2.231500000	33.42	17.11
149	2.246000000	33.36	17.11
150	2.260500000	33.28	17.08
151	2.275000000	33.22	17.08
152	2.289500000	33.12	17.09
153	2.304000000	33.04	17.07
154	2.318500000	32.98	17.10
155	2.333000000	32.89	17.08
156	2.347500000	32.82	17.08
157	2.362000000	32.76	17.08
158	2.376500000	32.73	17.09
159	2.391000000	32.62	17.07
160	2.405500000	32.56	17.05
161	2.420000000	32.47	17.07
162	2.434500000	32.42	17.08
163	2.449000000	32.33	17.08
164	2.463500000	32.27	17.06
165	2.478000000	32.23	17.06
166	2.492500000	32.15	17.07
167	2.507000000	32.07	17.09

168	2.521500000	31.98	17.10
169	2.536000000	31.94	17.10
170	2.550500000	31.84	17.04
171	2.565000000	31.80	17.08
172	2.579500000	31.74	17.07
173	2.594000000	31.69	17.05
174	2.608500000	31.60	17.06
175	2.623000000	31.55	17.06
176	2.637500000	31.45	17.05
177	2.652000000	31.38	17.07
178	2.666500000	31.34	17.10
179	2.681000000	31.28	17.07
180	2.695500000	31.22	17.06
181	2.710000000	31.14	17.06
182	2.724500000	31.09	17.06
183	2.739000000	31.06	17.05
184	2.753500000	30.97	17.05
185	2.768000000	30.89	17.10
186	2.782500000	30.83	17.10
187	2.797000000	30.79	17.07
188	2.811500000	30.73	17.05
189	2.826000000	30.66	17.05
190	2.840500000	30.58	17.13
191	2.855000000	30.51	17.10
192	2.869500000	30.46	17.12
193	2.884000000	30.40	17.06
194	2.898500000	30.36	17.05
195	2.913000000	30.30	17.09
196	2.927500000	30.24	17.10
197	2.942000000	30.16	17.09
198	2.956500000	30.10	17.09
199	2.971000000	30.04	17.08
200	2.985500000	30.00	17.06
201	3.000000000	29.93	17.06

900 MHz validation 5-18-00

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DASY

Dipole Validation Kit

Type: D900V2

Serial: 024

Manufactured: December 1997
Calibrated: January 1998

1. Measurement Conditions

The measurements were performed in the flat section of the new generic twin phantom (shell thickness 2mm) filled with brain simulating sugar solution of the following electrical parameters at 900 MHz:

Relative Dielectricity	**42.3**	± 5%
Conductivity	**0.85 mho/m**	± 5%

The DASY3 System (Software version 1.0a) with a dosimetric E-field probe ET3DV4 (SN:1302, Conversion factor 5.5) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the centre marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15mm from dipole centre to the solution surface. The included distance holder was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 5x5x7 fine cube was chosen for cube integration. Probe isotropy errors were cancelled by measuring the SAR with normal and 90° turned probe orientations and averaging. The dipole input power (forward power) was 250mW ± 3 %. The results are normalised to 1W input power.

2. SAR Measurement

Standard SAR-measurements were performed with the phantom according to the measurement conditions described in section 1. The results have been normalised to a dipole input power of 1W (forward power). The resulting averaged SAR-values are:

averaged over 1 cm^3 (1 g) of tissue:	**9.44 mW/g**
averaged over 10 cm^3 (10 g) of tissue:	**6.16 mW/g**

Note: If the liquid parameters for validation are slightly different from the ones used for initial calibration, the SAR-values will be different as well. The estimated sensitivities of SAR-values and penetration depths to the liquid parameters are listed in the DASY Application Note 4: 'SAR Sensitivities'.

3. Dipole Impedance and return loss

The impedance was measured at the SMA-connector with a network analyser and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.397 ns**	(one direction)
Transmission factor:	**0.988**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance holder was in place during impedance measurements.

Feedpoint impedance at 900 MHz:	Re{Z} = **50.2 Ω**
	Im {Z} = **-0.0 Ω**
Return Loss at 900 MHz	**- 54.9 dB**

4. Handling

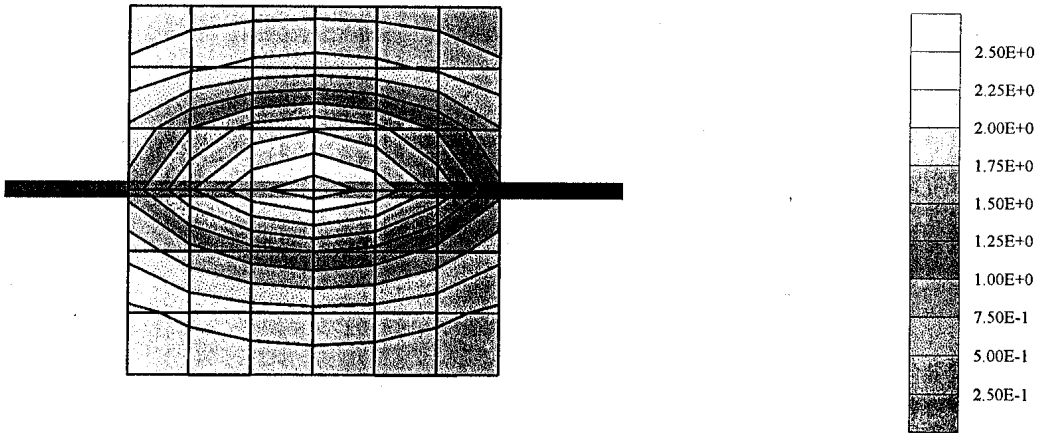
The dipole is made of standard semirigid coaxial cable. The centre conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

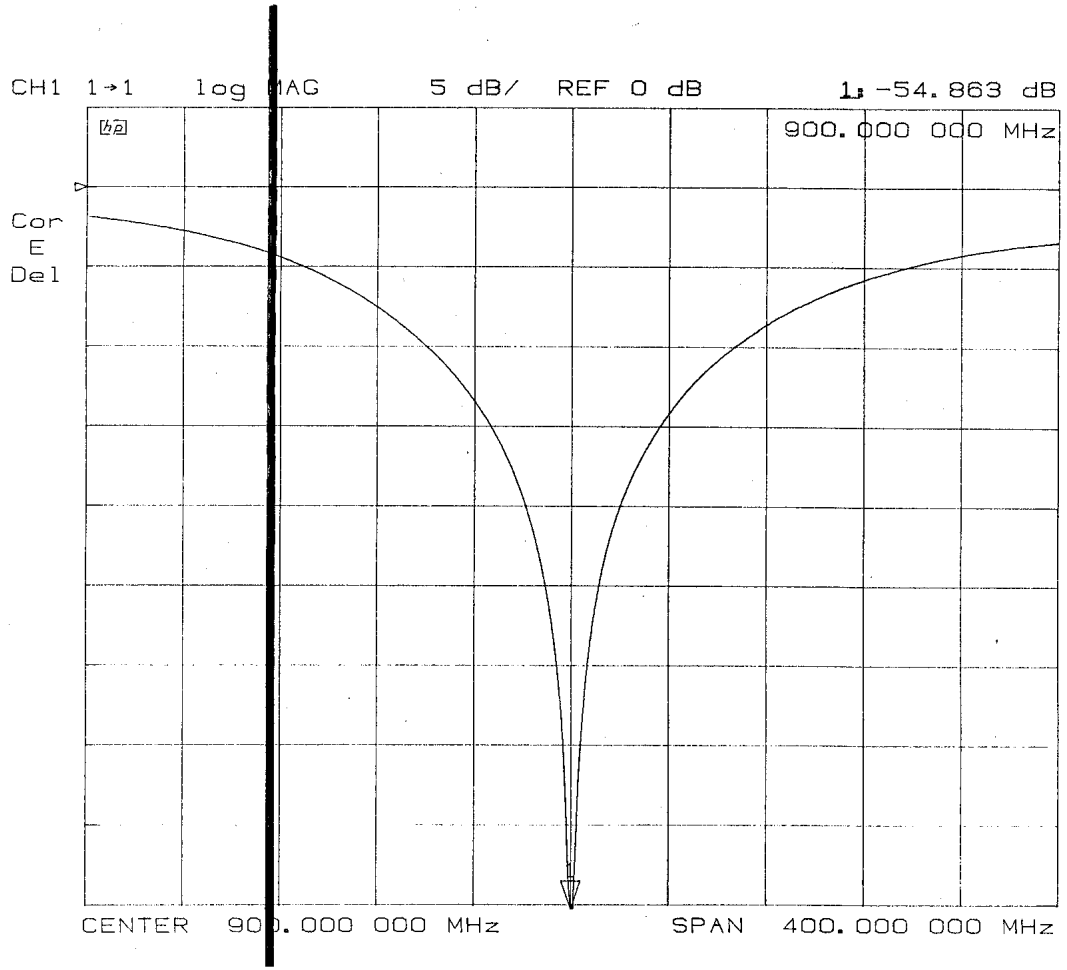
Do not apply excessive force to the dipole arms, because they might bend. If the dipole arms have to be bent back, take care to release stress to the soldered connections near the feedpoint; they might come off.

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

Validation Dipole D900V2 SN:024, d = 15mm

Frequency: 900 [MHz]; Antanna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 15.0, Dy = 15.0, Dz = 10.0 [mm]
Probe: ET3DV5 - SN1302 DAE3; ConvF(5.40,5.40,5.40); Crest factor: 1.0; }: σ = 0.85 [mho/m] ε_r = 42.3 ρ = 1.00 [g/cm^3]
Cubes (2): Peak: 3.58 [mW/g] ± 0.06 dB, SAR (1g): 2.36 [mW/g] ± 0.05 dB, SAR (10g): 1.54 [mW/g] ± 0.04 dB, (Worst-case extrapolation)
Penetration depth: 13.1 (12.1, 14.4) [mm]
Powerdrift: 0.03 dB





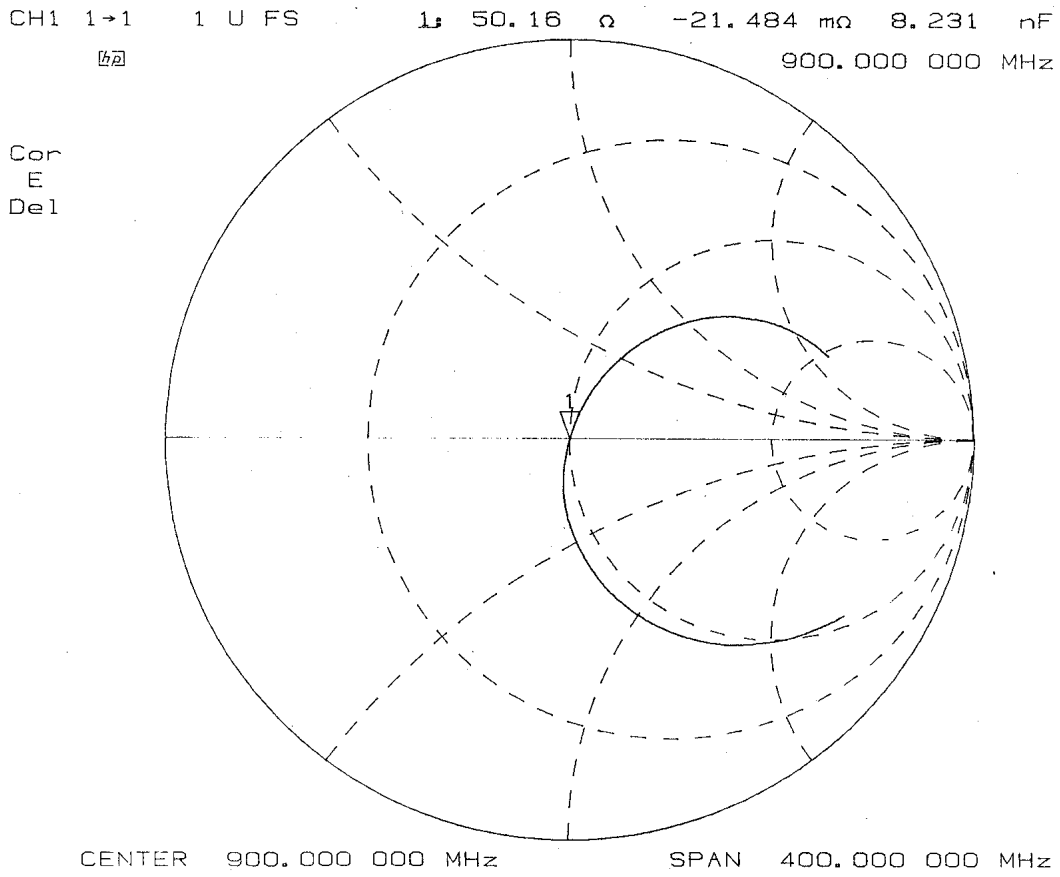
D900V2 SN: 024

S11

Flat phantom with brain simulating solution

d = 15mm

(distance from dipole center to solution)



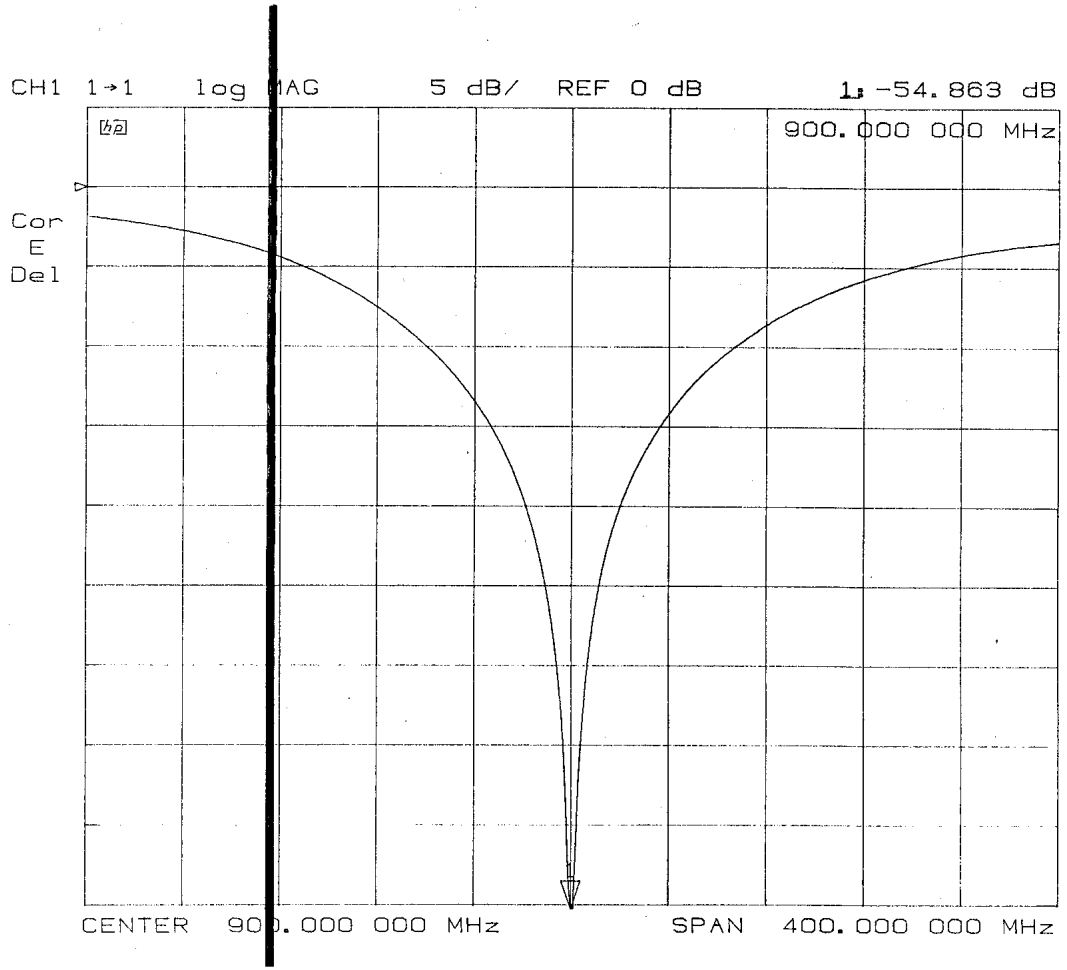
D900V2 SN: 024

S11

Flat phantom with brain simulating solution

d = 15mm

(distance from dipole center to solution)



D900V2 SN: 024

S11

Flat phantom with brain simulating solution

d = 15mm

(distance from dipole center to solution)

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Probe ET3DV5

SN:1348

Manufactured: August 1998
Calibrated: August 1998

Calibrated for System DASY3

ET3DV5 SN:1348

Introduction

The performance of all probes is measured before delivery. This includes an assessment of the characteristic parameters, receiving patterns as a function of frequency, frequency response and relative accuracy. Furthermore, each probe is tested in use according to a dosimetric assessment protocol. The sensitivity parameters (NormX, NormY, NormZ), the diode compresion parameter (DCP) and the conversion factor (ConvF) of the probe and some of the measurement diagrams are given in the following.

The performance of the individual probes varies slightly due to tolerances arising from the manufacturing process. Since the lines are highly resistive (several MOhms), the offset and noise problem is greatly increased if signals in the low μV range are measured. Accurate measurement below 10 μW/g are possible if the following precautions are taken. 1) check the current grounding with the *multimeter*[1], i.e., low noise levels, 2) compensate the current *offset*[1], 3) use long integration time (approx. 10 seconds), 4) *calibrate*[1] before each measurement, 5) persons should avoid moving around the lab while measuring.

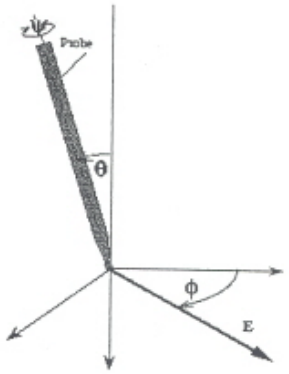


Fig 1: Due to the field distortion caused by the supporting material, the probe has two characteristic directions, referred to as angle ψ and θ.

Since the field distortion caused by the supporting material and the sheath is quite high in the θ direction, the receiving pattern is poor in air. However, the distortion in tissue equivalent material is much less because of its high dielectricity. In addition, the fields induced in the phantoms by dipole structures close to the body are dominently parallel to the surface. Thus, the error due to non-isotropy is much better than 1 dB for dosimetric assessments.

The probes are calibrated in the TEM cell ifi 110 although the field distribution in the cell is not very uniform and the frequency response is not very flat. To ensure consistency, a strict protocol is followed. The conversion factor (ConF) between this calibration and the measurement in the tissue simulation solution is performed by comparison with temperature measurements and computer simulations. This conversion factor is only valid for the specified tissue simulating liquids at the specified frequencies. If measurements have to be performed in solutions with other electrical properties or at other frequencies, the conversion factor has to be assessed by the same procedure.

As the probes have been constructed with printed resistive lines on ceramic substrates (thick film technique), the probe is very delicate with respect to mechanical shocks.

Attention:

Do not drop the probe or let the probe collide with any solid object. Never let the robot move without first activating the emergency stop feature (i.e., without first turning the data acquisition electronics on).

[1] Feature of the DASY2 Software Tool.

ET3DV5 SN:1348

DASY3 - Parameters of Probe: ET3DV5 SN:1348

Sensitivity in Free Space

NormX	**1.38**	$\mu V/(V/m)^2$
NormY	**1.72**	$\mu V/(V/m)^2$
NormZ	**1.92**	$\mu V/(V/m)^2$

Diode Compression

DCP X	**94**	mV
DCP Y	**94**	mV
DCP Z	**94**	mV

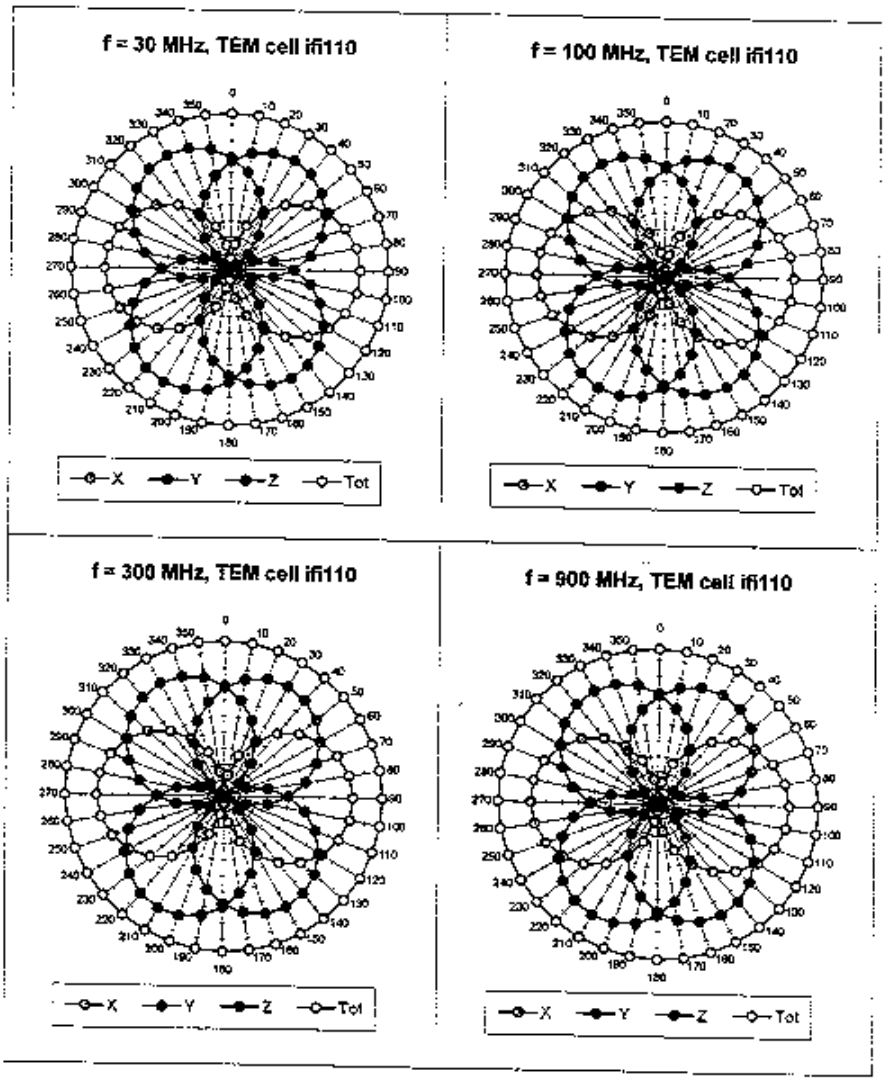
Sensitivity in Tissue Simulating Liquid

450 MHz	ConvF X	**6.4**	extrapolated	ε_r = 48 ± 5% σ = 0.50 ± 10% mho/m (brain tissue simulating liquid)
	ConvF Y	**6.4**	extrapolated	
	ConvF Z	**6.4**	extrapolated	
900 MHz	ConvF X	**5.9**	± 10%	ε_r = 42.5 ± 5% σ = 0.86 ± 10% mho/m (brain tissue simulating liquid)
	ConvF Y	**5.9**	± 10%	
	ConvF Z	**5.9**	± 10%	
1500 MHz	ConvF X	**5.3**	interpolated	ε_r = 41 ± 5% σ = 1.32 ± 10% mho/m (brain tissue simulating liquid)
	ConvF Y	**5.3**	interpolated	
	ConvF Z	**5.3**	interpolated	
1800 MHz	ConvF X	**5.0**	± 10%	ε_r = 40.5 ± 5% σ = 1.69 ± 10% mho/m (brain tissue simulating liquid)
	ConvF Y	**5.0**	± 10%	
	ConvF Z	**5.0**	± 10%	

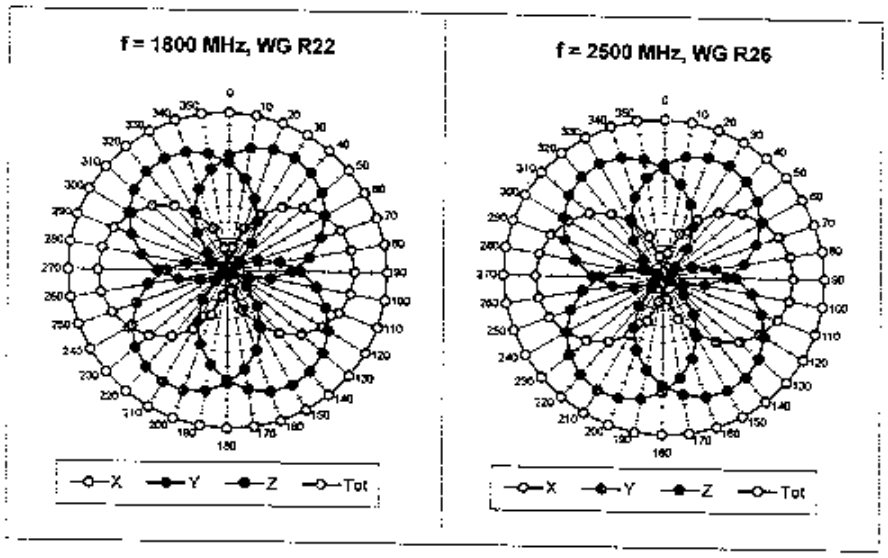
Sensor Offset

Probe Tip to Sensor Center	**2.7**	mm
Surface to Probe Tip	**1.9 ± 0.2**	mm

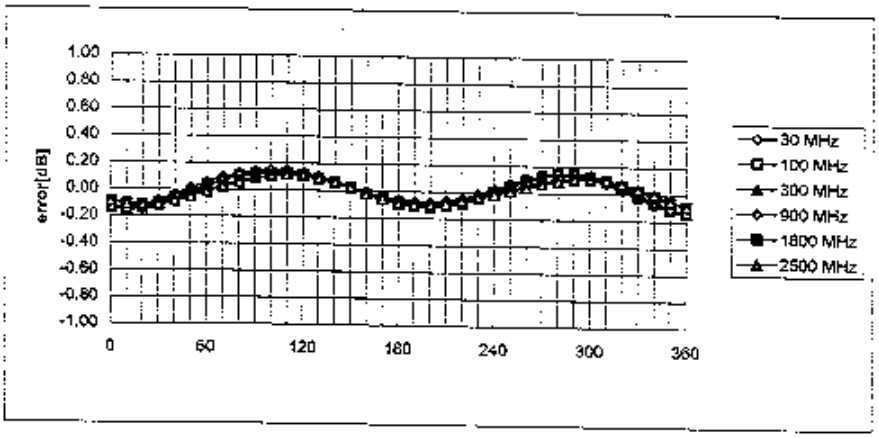
Receiving Pattern (ϕ), θ = 0°



ET3DV5 SN:1348



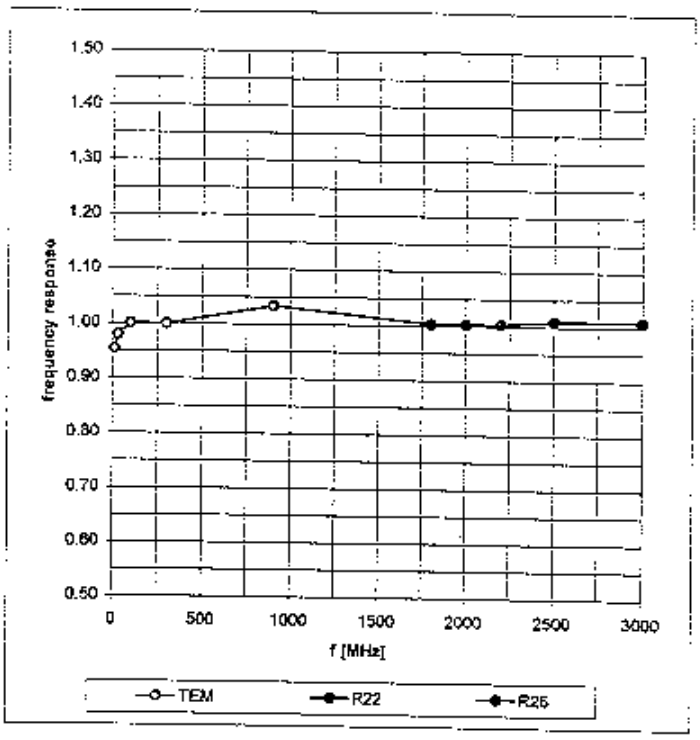
Isotropy Error (ϕ), θ = 0°



ET3DV5 SN:1348

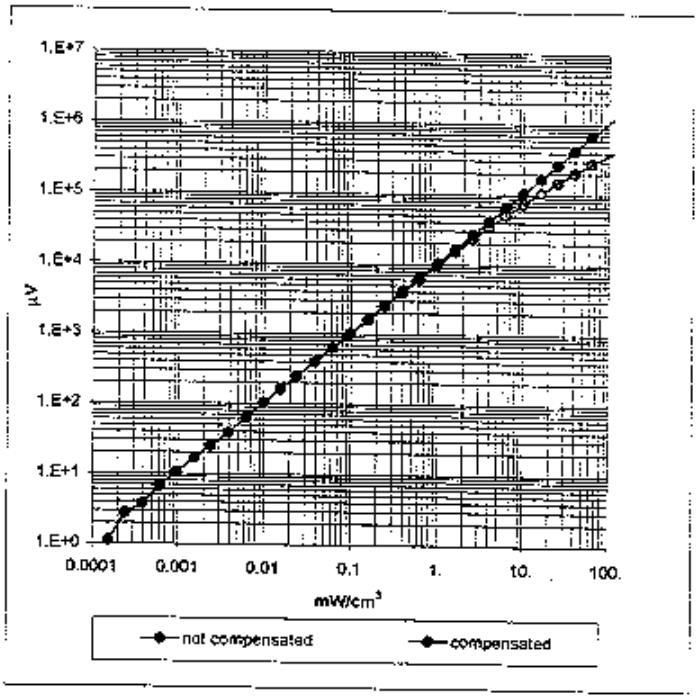
Frequency Response of E-Field

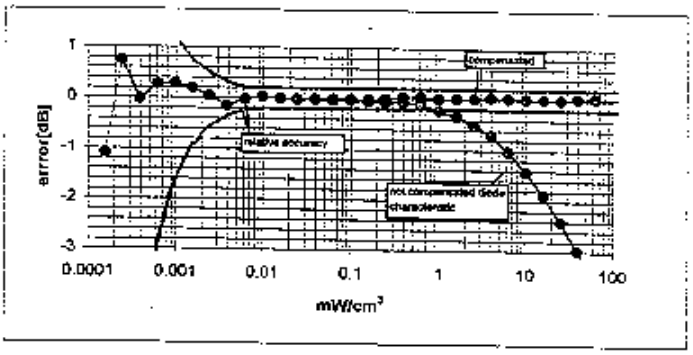
(TEM-Cell:iff110, Waveguide R22, R26)



Dynamic Range f(SAR_{brain})

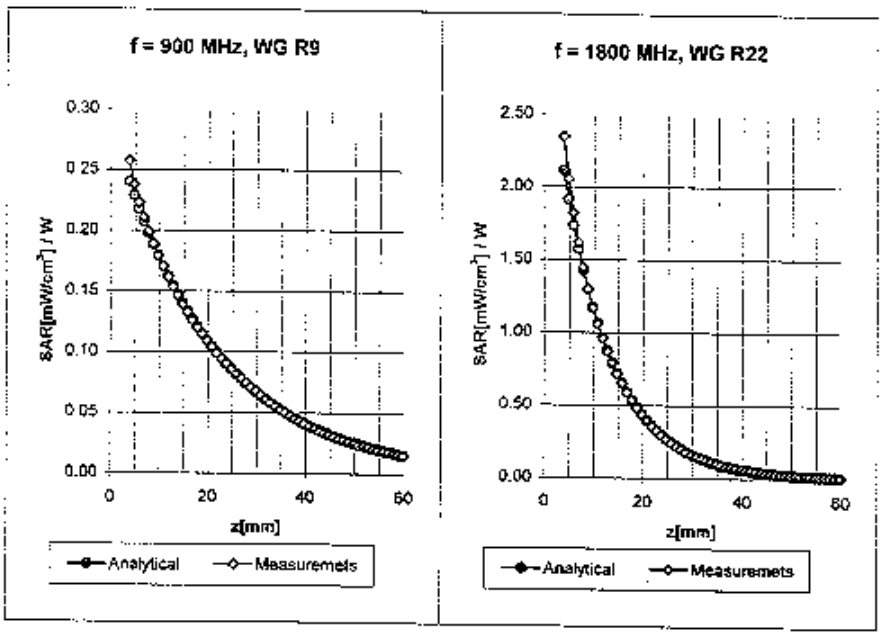
(TEM-Cell:ifi110)





ET3DV5 SN:1348

Conversion Factor Assessment



Receiving Pattern (ϕ)

(in brain tissue, z = 5 mm)