

ANNEX

Basis for a UMTS measurement recommendation

Project

08R2-HFumts

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APPENDIX A LABORATORY MEASUREMENTS

A.1 LABORATORY MEASUREMENTS TABLES

Table A-1: Profile of CPICH and UMTS channel power along a horizontal line at $x = 30$ cm / $z = 10$ cm

y (cm)	without panel		with panel	
	$P_{P-CPICH}$ (dBm)	$P_{channel}$ (dBm)	$P_{P-CPICH}$ (dBm)	$P_{channel}$ (dBm)
160	-69.5	-59.5	-62.3	-52.3
162	-66.2	-56.2	-63.8	-53.8
164	-67.7	-57.7	-77.0	-67.0
166	-77.0	-67.0	-67.4	-57.4
168	-72.0	-62.0	-64.2	-54.2
170	-67.4	-57.4	-68.3	-58.4
172	-68.3	-58.3	-70.3	-60.3
174	-67.0	-57.0	-63.5	-53.5
176	-64.0	-54.0	-63.1	-53.1
178	-64.5	-54.5	-69.0	-59.0
180	-70.0	-60.0	-70.5	-60.5
182	-71.0	-61.0	-64.8	-54.8
184	-66.1	-56.1	-65.6	-55.6
186	-67.7	-57.7	-73.2	-63.2
188	-73.8	-63.7	-72.4	-62.3
190	-70.7	-60.7	-72.5	-62.5
192	-70.2	-60.2	-80.2	-70.0
194	-74.6	-64.6	-69.4	-59.4
196	-68.2	-58.2	-66.5	-56.5
198	-65.9	-55.9	-70.1	-60.0
200	-68.5	-58.4	-80.0	-69.2

Table A-2: Profile of CPICH and UMTS channel power along a horizontal line at $x = 50$ cm / $z = 10$ cm

y (cm)	without panel		with panel	
	$P_{P-CPICH}$ (dBm)	$P_{channel}$ (dBm)	$P_{P-CPICH}$ (dBm)	$P_{channel}$ (dBm)
160	-67.9	-57.9	-67.0	-57.0
162	-68.7	-58.7	-70.3	-60.3
164	-71.8	-61.8	-73.2	-63.0
166	-68.4	-58.4	-66.6	-56.6
168	-66.2	-56.2	-66.0	-56.0
170	-68.1	-58.1	-70.4	-60.5
172	-71.6	-61.7	-69.8	-59.8
174	-68.5	-58.5	-65.4	-55.4
176	-66.6	-56.6	-66.4	-54.4
178	-67.6	-57.6	-74.2	-64.2
180	-68.2	-58.1	-69.0	-59.0
182	-67.2	-57.3	-66.6	-56.6
184	-68.4	-58.4	-68.6	-58.6
186	-70.4	-60.3	-70.6	-60.5
188	-68.0	-58.0	-69.0	-59.0
190	-67.3	-57.3	-71.2	-61.1
192	-70.5	-60.5	-73.3	-63.3
194	-68.6	-58.6	-68.0	-58.0
196	-65.0	-55.0	-68.0	-58.0
198	-65.6	-55.6	-76.0	-66.0
200	-74.5	-64.4	-69.2	-59.2

Table A-3: Profile of CPICH and UMTS channel power along a horizontal line at x = 50 cm / z = 30 cm

y (cm)	without panel		with panel	
	P _{P-CPICH} (dBm)	P _{channel} (dBm)	P _{P-CPICH} (dBm)	P _{channel} (dBm)
160	-63.5	-53.4	-65.0	-55.0
162	-64.0	-54.0	-62.6	-52.6
164	-64.5	-54.4	-64.4	-54.5
166	-65.2	-55.2	-68.5	-58.5
168	-65.6	-55.6	-65.6	-55.6
170	-64.0	-54.0	-64.6	-54.6
172	-63.7	-53.7	-68.0	-58.0
174	-65.2	-55.2	-67.3	-57.3
176	-66.8	-56.8	-65.6	-55.6
178	-66.1	-56.1	-70.6	-60.6
180	-64.8	-54.8	-70.0	-60.0
182	-63.0	-53.0	-63.0	-53.0
184	-62.0	-52.0	-61.9	-51.9
186	-63.0	-53.0	-66.0	-56.0
188	-65.8	-55.7	-72.1	-62.1
190	-65.8	-55.8	-66.1	-56.1
192	-65.0	-55.0	-65.5	-55.5
194	-67.0	-56.9	-69.0	-59.0
196	-66.5	-56.4	-70.5	-60.3
198	-64.5	-54.5	-67.5	-57.5
200	-66.0	-56.0	-69.0	-59.0

Table A-4: Profile of CPICH and UMTS channel power along a vertical line at x = 30 cm / y = 200 cm with reflecting panel

z (cm)	P _{P-CPICH} (dBm)	P _{channel} (dBm)
4	-68.0	-58.0
6	-70.6	-60.6
8	-74.8	-64.5
10	-77.6	-66.9
12	-77.1	-66.5
14	-73.1	-63.0
16	-68.8	-58.7
18	-65.7	-55.7
20	-65.0	-55.0
22	-65.1	-55.1
24	-66.2	-56.2
26	-68.2	-58.2
28	-71.2	-61.2
30	-77.3	-67.3
32	-76.6	-66.6
34	-72.9	-62.9
36	-67.9	-57.9
38	-65.7	-55.8
40	-65.4	-55.5
42	-66.7	-56.7
44	-69.2	-59.2
46	-71.7	-61.7
48	-72.6	-62.5
50	-71.0	-60.9
52	-67.7	-57.7
54	-66.3	-56.3
56	-66.2	-56.2
58	-66.8	-56.8
60	-69.0	-58.9
62	-70.5	-60.4
64	-70.7	-60.5
66	-69.3	-59.3
68	-67.9	-57.9
70	-66.3	-56.2
72	-65.5	-55.5
74	-66.2	-56.2
76	-66.5	-56.5
78	-66.1	-56.1
80	-65.6	-55.6

Table A-5: Grid measurement of CPICH power (dBm) at z = 10 cm, biconical antenna

	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-62.0	-56.0	-57.1	-57.7	-56.0	-65.0	-64.0	-60.0	-58.0	-57.5	-62.6	-62.6	-60.0
5	-60.1	-56.8	-55.6	-56.8	-59.1	-60.2	-63.3	-60.0	-56.7	-55.4	-58.8	-60.4	-56.0
10	-60.4	-56.5	-57.2	-55.2	-59.4	-59.0	-68.2	-61.4	-55.9	-59.9	-58.5	-58.4	-58.5
15	-60.8	-56.6	-59.3	-55.6	-63.5	-57.0	-66.0	-62.0	-56.5	-59.9	-59.6	-61.8	-59.2
20	-58.6	-57.8	-62.8	-57.5	-61.0	-61.1	-62.9	-65.5	-56.9	-58.4	-59.4	-59.2	-62.4
25	-59.6	-59.3	-59.8	-58.4	-53.9	-74.3	-66.9	-67.6	-59.0	-59.2	-59.7	-55.1	-68.1
30	-60.2	-57.3	-65.0	-56.4	-53.2	-63.8	-60.2	-75.0	-59.8	-60.4	-61.2	-56.1	-72.5
35	-61.0	-55.3	-65.3	-55.2	-54.5	-62.1	-58.3	-73.3	-61.8	-59.3	-58.2	-56.2	-74.6
40	-57.8	-57.0	-65.0	-56.4	-55.0	-70.3	-61.2	-63.8	-61.3	-60.1	-58.0	-54.5	-73.9
45	-56.4	-58.0	-64.0	-58.3	-55.3	-63.5	-62.5	-60.2	-61.5	-59.0	-58.1	-56.1	-66.0
50	-56.1	-58.9	-63.8	-55.2	-57.3	-64.9	-56.7	-62.3	-65.3	-61.0	-56.6	-56.4	-66.2
55	-56.5	-61.7	-62.0	-56.5	-54.8	-67.0	-56.8	-64.2	-65.2	-60.1	-57.7	-54.1	-61.5
60	-56.4	-61.5	-58.7	-53.0	-54.1	-69.4	-56.8	-67.1	-60.7	-58.3	-56.7	-54.5	-60.2

Table A-6: Grid measurement of UMTS channel power (dBm) at z = 10 cm, biconical antenna

	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-52.0	-46.0	-47.2	-47.7	-46.0	-55.0	-54.0	-50.0	-48.0	-47.5	-52.4	-52.7	-50.0
5	-50.1	-46.8	-45.6	-46.8	-49.1	-50.2	-53.3	-50.0	-46.7	-45.4	-48.8	-50.4	-46.0
10	-50.3	-46.5	-47.2	-45.2	-49.4	-49.0	-58.1	-51.3	-45.9	-49.8	-48.4	-48.3	-48.5
15	-50.7	-46.6	-49.2	-45.6	-53.5	-47.0	-55.9	-52.0	-46.4	-49.9	-49.6	-51.8	-49.2
20	-48.6	-47.8	-52.8	-47.5	-51.0	-51.1	-52.9	-55.5	-46.9	-48.4	-49.4	-49.3	-52.4
25	-49.6	-49.3	-49.8	-48.4	-43.8	-63.4	-56.8	-57.6	-48.9	-49.2	-49.7	-45.1	-58.0
30	-50.2	-47.2	-55.0	-46.4	-43.2	-53.8	-50.2	-63.5	-49.7	-50.3	-51.2	-46.1	-62.4
35	-51.0	-45.3	-55.5	-45.2	-44.5	-52.0	-48.3	-63.1	-51.6	-49.2	-48.1	-46.2	-64.4
40	-47.7	-47.0	-55.0	-46.4	-45.0	-59.2	-51.2	-53.7	-51.3	-50.0	-48.0	-44.5	-63.0
45	-46.5	-48.0	-53.8	-48.3	-45.2	-53.5	-52.5	-50.1	-51.5	-49.0	-48.1	-46.1	-56.0
50	-46.1	-49.0	-53.7	-45.3	-47.3	-54.8	-46.7	-52.2	-55.4	-51.0	-46.5	-46.4	-56.1
55	-46.4	-51.7	-52.0	-43.5	-44.8	-57.0	-46.8	-53.9	-55.2	-50.1	-47.6	-44.1	-51.5
60	-46.4	-51.4	-48.6	-43.0	-44.1	-59.4	-46.8	-56.6	-50.7	-48.3	-46.7	-44.5	-50.2

Table A-7: Grid measurement of CPICH power (dBm) at z = 30 cm, biconical antenna

	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-59.1	-53.7	-61.6	-67.3	-60.6	-58.1	-57.7	-58.7	-64.2	-63.8	-60.6	-60.3	-65.1
5	-58.6	-53.7	-63.0	-64.8	-59.6	-60.0	-54.9	-59.6	-60.7	-72.4	-62.3	-56.7	-63.0
10	-61.0	-55.0	-66.2	-66.7	-58.2	-63.7	-58.3	-60.3	-59.3	-64.7	-71.8	-57.3	-62.9
15	-59.7	-55.5	-69.7	-70.0	-56.9	-64.8	-62.3	-61.2	-58.5	-61.8	-77.9	-57.3	-60.2
20	-60.4	-54.4	-65.5	-73.4	-56.0	-65.0	-60.0	-58.1	-58.7	-61.8	-69.0	-55.4	-61.0
25	-63.8	-54.1	-60.1	-61.8	-55.7	-67.0	-59.7	-57.4	-57.4	-60.6	-63.4	-57.1	-58.6
30	-58.7	-62.0	-56.2	-64.1	-60.8	-58.8	-61.0	-58.6	-57.6	-58.9	-72.3	-56.2	-57.7
35	-58.4	-56.3	-60.0	-61.8	-56.7	-64.7	-61.8	-59.0	-59.0	-60.5	-67.2	-55.6	-58.2
40	-58.6	-56.9	-58.5	-60.5	-60.9	-63.8	-63.8	-64.2	-56.4	-62.0	-61.3	-58.0	-55.9
45	-57.7	-57.8	-59.3	-58.1	-64.2	-64.7	-64.8	-64.2	-56.9	-60.8	-61.7	-61.7	-55.5
50	-58.4	-56.7	-62.2	-62.8	-61.7	-70.3	-64.4	-58.8	-58.6	-62.6	-64.9	-59.8	-55.4
55	-60.8	-58.2	-60.6	-69.7	-59.0	-72.7	-62.0	-59.0	-57.5	-59.1	-61.1	-58.9	-58.0
60	-63.4	-60.0	-60.4	-70.2	-59.0	-69.1	-59.3	-60.5	-56.5	-58.0	-58.5	-57.9	-58.5

Table A-8: Grid measurement of UMTS channel power (dBm) at z = 30 cm, biconical antenna

X (cm)	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-49.1	-43.7	-51.6	-57.2	-50.6	-48.0	-47.7	-48.7	-54.2	-53.8	-50.6	-50.3	-55.0
5	-48.5	-43.7	-53.0	-54.8	-49.6	-50.0	-44.9	-49.6	-50.7	-62.4	-52.3	-46.7	-53.0
10	-51.0	-45.0	-55.7	-56.7	-48.2	-53.7	-48.3	-50.3	-49.3	-54.7	-61.6	-47.2	-52.8
15	-49.7	-45.5	-58.9	-59.8	-46.9	-54.3	-52.3	-51.5	-48.5	-51.8	-68.0	-47.3	-50.2
20	-50.5	-44.4	-55.4	-63.2	-46.0	-55.0	-50.0	-48.0	-48.6	-51.8	-59.0	-45.4	-51.0
25	-53.8	-44.1	-50.2	-51.8	-45.7	-57.0	-49.7	-47.4	-47.4	-50.6	-53.4	-47.1	-48.5
30	-48.7	-52.0	-46.2	-54.1	-50.9	-48.7	-51.0	-48.6	-47.6	-48.9	-62.3	-46.1	-47.7
35	-48.4	-46.3	-50.0	-51.8	-46.7	-54.7	-51.7	-49.0	-49.0	-50.5	-57.1	-45.6	-48.2
40	-48.6	-46.9	-48.5	-50.5	-50.9	-53.8	-53.8	-54.2	-46.4	-52.0	-51.3	-48.0	-45.9
45	-47.7	-47.8	-49.3	-48.0	-54.2	-54.6	-54.8	-54.2	-46.9	-50.8	-51.7	-51.7	-45.5
50	-48.4	-46.6	-52.2	-52.5	-51.6	-59.6	-54.3	-48.8	-48.6	-52.5	-54.8	-49.8	-45.4
55	-50.8	-48.2	-50.5	-58.3	-49.0	-61.6	-52.0	-49.0	-47.4	-49.1	-51.1	-48.9	-48.0
60	-53.4	-50.0	-50.3	-59.7	-49.0	-59.0	-49.3	-50.5	-46.4	-48.0	-48.4	-47.8	-48.5

Table A-9: Grid measurement of CPICH power (dBm) at z = 50 cm, biconical antenna

X (cm)	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-69.4	-67.6	-61.2	-63.1	-59.0	-57.3	-79.0	-66.9	-74.8	-62.4	-67.0	-56.2	-55.2
5	-64.4	-63.0	-59.5	-63.5	-57.0	-58.4	-65.7	-71.6	-67.7	-58.2	-60.8	-61.9	-55.0
10	-62.0	-64.2	-57.3	-79.0	-55.3	-57.2	-63.3	-68.8	-63.7	-56.3	-61.2	-63.6	-54.1
15	-59.6	-70.8	-57.0	-70.8	-56.9	-57.0	-68.8	-69.1	-75.3	-57.0	-63.0	-64.8	-53.6
20	-57.9	-64.6	-58.4	-69.0	-56.1	-56.7	-68.1	-66.0	-67.7	-57.3	-60.0	-63.2	-53.4
25	-59.6	-61.9	-55.6	-69.3	-57.3	-56.6	-64.1	-63.2	-67.5	-56.4	-60.2	-62.1	-53.0
30	-60.0	-59.2	-57.3	-61.4	-60.8	-57.0	-63.0	-65.7	-70.0	-57.8	-60.0	-67.3	-53.7
35	-57.0	-60.7	-61.0	-61.2	-60.8	-57.6	-60.0	-65.4	-64.2	-58.0	-60.4	-73.0	-55.0
40	-57.2	-62.6	-61.0	-65.1	-59.9	-54.6	-58.0	-64.6	-72.5	-58.1	-61.3	-67.4	-56.2
45	-51.0	-61.0	-61.0	-63.3	-60.0	-54.6	-58.8	-68.8	-65.2	-57.6	-62.5	-73.0	-56.6
50	-60.7	-59.6	-62.6	-66.9	-59.0	-56.4	-59.0	-61.9	-68.1	-57.3	-63.0	-76.6	-56.1
55	-57.7	-62.6	-60.8	-67.2	-58.8	-55.3	-60.0	-61.5	-70.0	-59.4	-63.5	-64.6	-58.2
60	-58.8	-63.0	-60.9	-65.4	-59.7	-53.6	-60.5	-60.0	-65.4	-58.7	-65.5	-62.0	-58.5

Table A-10: Grid measurement of UMTS channel power (dBm) at z = 50 cm, biconical antenna

X (cm)	Y(cm)												
	160	165	170	175	180	185	190	195	200	205	210	215	220
0	-59.6	-57.7	-51.2	-53.1	-49.0	-47.3	-67.6	-56.4	-63.7	-52.4	-56.6	-46.2	-45.2
5	-54.4	-53.0	-49.5	-53.5	-47.0	-48.4	-55.6	-61.4	-57.6	-48.2	-50.8	-51.9	-45.0
10	-52.0	-54.0	-47.3	-68.0	-45.2	-47.0	-53.0	-58.8	-53.6	-46.4	-51.1	-53.6	-44.0
15	-49.5	-60.0	-47.0	-60.9	-46.9	-47.0	-58.9	-59.1	-64.9	-47.0	-53.0	-54.8	-43.5
20	-47.9	-54.5	-48.4	-58.6	-46.0	-46.7	-57.9	-56.0	-57.7	-47.3	-50.0	-53.2	-43.4
25	-49.6	-51.8	-45.6	-59.2	-47.3	-46.7	-54.0	-53.2	-57.4	-46.4	-50.2	-52.1	-43.0
30	-50.0	-49.2	-47.3	-51.3	-50.8	-47.0	-53.0	-55.7	-60.0	-47.8	-50.0	-57.3	-43.7
35	-47.0	-50.7	-51.0	-51.2	-50.8	-47.6	-50.0	-55.4	-54.2	-48.0	-50.3	-62.6	-45.0
40	-47.2	-52.5	-51.0	-54.8	-49.9	-44.6	-48.0	-54.6	-62.4	-48.1	-51.3	-57.4	-46.2
45	-51.0	-51.0	-51.0	-53.2	-50.0	-44.6	-48.7	-58.7	-55.2	-47.6	-52.5	-63.0	-46.5
50	-50.7	-49.6	-52.5	-56.9	-49.0	-46.4	-49.0	-51.8	-58.0	-47.3	-53.0	-66.3	-46.1
55	-47.6	-52.5	-50.8	-57.2	-48.8	-45.3	-50.0	-51.5	-59.7	-49.4	-53.5	-54.5	-48.2
60	-48.8	-52.9	-50.9	-55.4	-49.7	-43.6	-50.5	-50.0	-55.2	-48.7	-55.5	-51.8	-48.5

Table A-11: "Schwenkmethode" measurements – instr#D (0.2 sa/s)

antenna	polarization	speed	P _{P_CPICH} (dBm)			P _{channel} (dBm)		
			1	2	3	1	2	3
biconical	fixed	low	-53.13	-53.80	-54.33	-43.06	-46.70	-45.95
		medium	-53.06	-52.76	-55.88	-42.90	-44.60	-43.85
		high	-59.83	-54.40	-54.86	-48.22	-44.61	-44.92
directional	fixed	low	-48.30	-37.00	-35.69	-55.26	-26.82	-25.33
		medium	-37.23	-35.90	-35.91	-27.38	-25.17	-25.67
		high	-37.93	-36.36	-36.09	-27.95	-26.18	-25.22
	varied	low	-39.22	-36.30	-35.80	-29.16	-26.14	-25.70
		medium	-37.52	-36.16	-36.51	-27.49	-25.87	-26.39
		high	-38.34	-36.01	-35.81	-28.30	-25.67	-25.48
			max (dBm)	deviation from global maximum (dB)	max (dBm)	deviation from global maximum (dB)		
biconical	fixed	low	-53.13	-2.13	-43.06	-0.06		
		medium	-52.76	-1.76	-42.90	0.10		
		high	-54.40	-3.40	-44.61	-1.61		
directional	fixed	low	-35.69	-1.19	-25.33	-0.83		
		medium	-35.90	-1.40	-25.17	-0.67		
		high	-36.09	-1.59	-25.22	-0.72		
	varied	low	-35.80	-1.30	-25.70	-1.20		
		medium	-36.16	-1.66	-25.87	-1.37		
		high	-35.81	-1.31	-25.48	-0.98		

Table A-12: "Schwenkmethode" measurements – instr#C (<1 sa/s)

antenna	polarization	speed	P _{P_CPICH} (dBm)			P _{channel} (dBm)		
			1	2	3	1	2	3
biconical	fixed	low	-52.40	-53.80	-53.80	-42.40	-43.80	-43.80
		medium	-53.60	-53.50	-53.20	-43.60	-43.40	-43.20
		high	-53.70	-54.30	-53.80	-43.60	-44.30	-43.70
directional	fixed	low	-37.10	-35.20	-34.40	-27.20	-25.20	-24.40
		medium	-36.50	-35.00	-34.60	-26.40	-25.00	-24.60
		high	-36.50	-35.30	-34.80	-26.50	-25.40	-24.80
	varied	low	-37.10	-35.80	-34.60	-27.20	-25.80	-24.60
		medium	-37.00	-34.70	-35.40	-27.00	-24.80	-25.50
		high	-37.30	-36.30	-34.40	-27.40	-26.30	-24.40
			max (dBm)	deviation from global maximum (dB)	max (dBm)	deviation from global maximum (dB)		
biconical	fixed	low	-52.40	-1.40	-42.40	0.60		
		medium	-53.20	-2.20	-43.20	-0.20		
		high	-53.70	-2.70	-43.60	-0.60		
directional	fixed	low	-34.40	0.10	-24.40	0.10		
		medium	-34.60	-0.10	-24.60	-0.10		
		high	-34.80	-0.30	-24.80	-0.30		
	varied	low	-34.60	-0.10	-24.60	-0.10		
		medium	-34.70	-0.20	-24.80	-0.30		
		high	-34.40	0.10	-24.40	0.10		

Table A-13: "Schwenkmethode" measurements – instr#F (2 sa/s)

antenna	polarization	speed	P _{P_CPICH} (dBm)			P _{channel} (dBm)		
			1	2	3	1	2	3
biconical	fixed	low	-51.60	-55.40	-56.80	-39.80	-41.80	-42.30
		medium	-50.80	-54.80	-54.40	-39.60	-41.60	-41.30
		high	-50.50	-53.10	-55.40	-38.80	-40.60	-41.60
directional	fixed	low	-36.60	-36.90	-35.90	-25.10	-24.50	-23.40
		medium	-36.40	-37.00	-36.50	-25.30	-25.10	-24.30
		high	-32.50	-38.10	-34.40	-22.00	-23.40	-23.10
	varied	low	-31.70	-38.20	-36.00	-20.80	-23.90	-24.20
		medium	-33.30	-38.00	-38.70	-22.10	-24.90	-24.20
		high	-35.90	-36.70	-35.10	-23.60	-24.30	-23.10
			max (dBm)	deviation from global maximum (dB)		max (dBm)	deviation from global maximum (dB)	
biconical	fixed	low	-51.60	-0.60	-39.80	3.20		
		medium	-50.80	0.20	-39.60	3.40		
		high	-50.50	0.50	-38.80	4.20		
directional	fixed	low	-35.90	-1.40	-23.40	1.10		
		medium	-36.40	-1.90	-24.30	0.20		
		high	-32.50	2.00	-22.00	2.50		
	varied	low	-31.70	2.80	-20.80	3.70		
		medium	-33.30	1.20	-22.10	2.40		
		high	-35.10	-0.60	-23.10	1.40		

Table A-14: "Schwenkmethode" measurement – deviation from global maximum, ordered by sampling rate

Instrument	sweep speed	sampling rate (sa/m)	P _{P_CPICH} , deviation from global max. (dB)			P _{channel} , deviation from global max. (dB)		
			biconical ¹	directional ¹	directional ²	biconical ¹	directional ¹	directional ²
instr#D	high	0.4	-3.40	-1.59	-1.31	-1.61	-0.72	-1.20
instr#D	medium	1.25	-1.76	-1.40	-1.66	0.10	-0.67	-1.37
instr#C	high	2.0	-2.70	-0.30	0.10	-0.60	-0.30	0.10
instr#D	low	2.5	-2.13	-1.19	-1.30	-0.06	-0.83	-1.20
instr#C	medium	6.2	-2.20	-0.10	-0.20	-0.20	-0.10	-0.30
instr#F	high	6.7	0.50	2.00	-0.60	4.20	2.50	1.40
instr#C	low	12.5	-1.40	0.10	-0.10	0.60	0.10	-0.10
instr#F	medium	20.8	0.20	-1.90	1.20	3.40	0.20	2.40
instr#F	low	41.7	-0.60	-1.40	2.80	3.20	1.10	3.70

¹⁾ single polarization

²⁾ multiple polarizations

A.2 CONVERSION TABLES

Table A-15 shows the signal attenuation in the air calculated at a frequency of 2.16 GHz with formula (A.1).

$$A = 37 + 20\text{Log}(f) + 20\text{Log}(d) \quad (\text{A.1})$$

where:

A = attenuation in (dB);

f = frequency in (MHz);

d = distance in (km).

Table A-15: Signal level attenuation for free space in function of the distance

f = 2.16 GHz (for laboratory)							
d (cm)	A (dB)	d (cm)	A (dB)	d (cm)	A (dB)	d (cm)	A (dB)
1	3.69	51	37.84	101	43.78	151	47.27
2	9.71	52	38.01	102	43.86	152	47.33
3	13.23	53	38.17	103	43.95	153	47.38
4	15.73	54	38.34	104	44.03	154	47.44
5	17.67	55	38.50	105	44.11	155	47.50
6	19.25	56	38.65	106	44.20	156	47.55
7	20.59	57	38.81	107	44.28	157	47.61
8	21.75	58	38.96	108	44.36	158	47.66
9	22.77	59	39.11	109	44.44	159	47.72
10	23.69	60	39.25	110	44.52	160	47.77
11	24.52	61	39.40	111	44.60	161	47.83
12	25.27	62	39.54	112	44.67	162	47.88
13	25.97	63	39.68	113	44.75	163	47.93
14	26.61	64	39.81	114	44.83	164	47.99
15	27.21	65	39.95	115	44.90	165	48.04
16	27.77	66	40.08	116	44.98	166	48.09
17	28.30	67	40.21	117	45.05	167	48.14
18	28.79	68	40.34	118	45.13	168	48.20
19	29.26	69	40.47	119	45.20	169	48.25
20	29.71	70	40.59	120	45.27	170	48.30
21	30.13	71	40.71	121	45.34	171	48.35
22	30.54	72	40.84	122	45.42	172	48.40
23	30.92	73	40.96	123	45.49	173	48.45
24	31.29	74	41.07	124	45.56	174	48.50
25	31.65	75	41.19	125	45.63	175	48.55
26	31.99	76	41.31	126	45.70	176	48.60
27	32.32	77	41.42	127	45.77	177	48.65
28	32.63	78	41.53	128	45.83	178	48.70
29	32.94	79	41.64	129	45.90	179	48.75
30	33.23	80	41.75	130	45.97	180	48.79
31	33.52	81	41.86	131	46.03	181	48.84
32	33.79	82	41.97	132	46.10	182	48.89
33	34.06	83	42.07	133	46.17	183	48.94
34	34.32	84	42.17	134	46.23	184	48.99
35	34.57	85	42.28	135	46.30	185	49.03
36	34.82	86	42.38	136	46.36	186	49.08
37	35.05	87	42.48	137	46.42	187	49.13
38	35.28	88	42.58	138	46.49	188	49.17
39	35.51	89	42.68	139	46.55	189	49.22
40	35.73	90	42.77	140	46.61	190	49.26
41	35.94	91	42.87	141	46.67	191	49.31
42	36.15	92	42.96	142	46.73	192	49.36
43	36.36	93	43.06	143	46.80	193	49.40
44	36.56	94	43.15	144	46.86	194	49.45
45	36.75	95	43.24	145	46.92	195	49.49
46	36.94	96	43.33	146	46.98	196	49.53
47	37.13	97	43.42	147	47.04	197	49.58
48	37.31	98	43.51	148	47.09	198	49.62
49	37.49	99	43.60	149	47.15	199	49.67
50	37.67	100	43.69	150	47.21	200	49.71

Formula (A.2) shows the relationship between the measured power P (dBm) and the corresponding electric field strength E (V/m) where $z_0 = 50 \Omega$ and k denotes the antenna factor (1/m).

$$E(v/m) = k \cdot \sqrt{z_0 \cdot \frac{10^{\frac{P(dBm)}{10}}}{1000}} \tag{A.2}$$

Table A-16 shows the antenna factors k for the two antennas (biconical and directional) to be inserted into formula (A.2). These values originate from the calibration of the antennas and are specific for the given frequency.

Table A-16: Antenna factor k - 2.16 GHz

biconical antenna		directional antenna	
(dB/m)	(1/m)	(dB/m)	(1/m)
40.08	100.93	23.70	15.31

Table A-17: Correspondence between measured power and electric field strength – biconical antenna

biconical antenna – 2160 MHz			
P (dBm)	E (v/m)	P (dBm)	E (v/m)
0	22.5676	-45	0.1269
-1	20.1134	-46	0.1131
-2	17.9261	-47	0.1008
-3	15.9766	-48	0.0898
-4	14.2392	-49	0.0801
-5	12.6907	-50	0.0714
-6	11.3106	-51	0.0636
-7	10.0806	-52	0.0567
-8	8.9843	-53	0.0505
-9	8.0073	-54	0.0450
-10	7.1365	-55	0.0401
-11	6.3604	-56	0.0358
-12	5.6687	-57	0.0319
-13	5.0523	-58	0.0284
-14	4.5028	-59	0.0253
-15	4.0131	-60	0.0226
-16	3.5767	-61	0.0201
-17	3.1878	-62	0.0179
-18	2.8411	-63	0.0160
-19	2.5321	-64	0.0142
-20	2.2568	-65	0.0127
-21	2.0113	-66	0.0113
-22	1.7926	-67	0.0101
-23	1.5977	-68	0.0090
-24	1.4239	-69	0.0080
-25	1.2691	-70	0.0071
-26	1.1311	-71	0.0064
-27	1.0081	-72	0.0057
-28	0.8984	-73	0.0051
-29	0.8007	-74	0.0045
-30	0.7136	-75	0.0040
-31	0.6360	-76	0.0036
-32	0.5669	-77	0.0032
-33	0.5052	-78	0.0028
-34	0.4503	-79	0.0025
-35	0.4013	-80	0.0023
-36	0.3577	-81	0.0020
-37	0.3188	-82	0.0018
-38	0.2841	-83	0.0016
-39	0.2532	-84	0.0014
-40	0.2257	-85	0.0013
-41	0.2011	-86	0.0011
-42	0.1793	-87	0.0010
-43	0.1598	-88	0.0009
-44	0.1424	-89	0.0008

Table A-18: Correspondence between measured power and electric field strength – directional antenna

directional antenna - 2160 MHz			
P (dBm)	E (v/m)	P (dBm)	E (v/m)
0	3.42362	-45	0.01925
-1	3.05130	-46	0.01716
-2	2.71947	-47	0.01529
-3	2.42373	-48	0.01363
-4	2.16016	-49	0.01215
-5	1.92524	-50	0.01083
-6	1.71587	-51	0.00965
-7	1.52927	-52	0.00860
-8	1.36297	-53	0.00766
-9	1.21474	-54	0.00683
-10	1.08264	-55	0.00609
-11	0.96491	-56	0.00543
-12	0.85997	-57	0.00484
-13	0.76645	-58	0.00431
-14	0.68310	-59	0.00384
-15	0.60881	-60	0.00342
-16	0.54261	-61	0.00305
-17	0.48360	-62	0.00272
-18	0.43101	-63	0.00242
-19	0.38414	-64	0.00216
-20	0.34236	-65	0.00193
-21	0.30513	-66	0.00172
-22	0.27195	-67	0.00153
-23	0.24237	-68	0.00136
-24	0.21602	-69	0.00121
-25	0.19252	-70	0.00108
-26	0.17159	-71	0.00096
-27	0.15293	-72	0.00086
-28	0.13630	-73	0.00077
-29	0.12147	-74	0.00068
-30	0.10826	-75	0.00061
-31	0.09649	-76	0.00054
-32	0.08600	-77	0.00048
-33	0.07665	-78	0.00043
-34	0.06831	-79	0.00038
-35	0.06088	-80	0.00034
-36	0.05426	-81	0.00031
-37	0.04836	-82	0.00027
-38	0.04310	-83	0.00024
-39	0.03841	-84	0.00022
-40	0.03424	-85	0.00019
-41	0.03051	-86	0.00017
-42	0.02719	-87	0.00015
-43	0.02424	-88	0.00014
-44	0.02160	-89	0.00012

A.3 ANTENNAS

A.3.1 BICONICAL ANTENNA PCD 8250



Figure A-1: Biconical antenna PCD8250

The Add3D (Addition of 3 Dimensional Field Components) is a unique and precision method for electrical field strength measurements, covering the frequency range from 80MHz up to 2.5GHz. It is a frequency selective measurement method making use of a spectrum analyzer and the broadband omnidirectional Precision Conical Dipole PCD8250 as measurement antenna.

Technical Data

Frequency Range :	80 MHz – 2.5 GHz
Antenna symmetry :	better than ± 0.15 dB
Connector type :	SMA female
Antenna width :	13.0 cm
Support Length :	14.7 cm
Sensitivity :	better than 1.1 mV/m

A.3.2 PLANAR ANTENNA SPA 2400/70/9/CP



SUHNER®
PLANAR ANTENNA WITH
CIRCULAR POLARISATION

SPA 2400/70/9/CP

Technical Data

Electrical properties

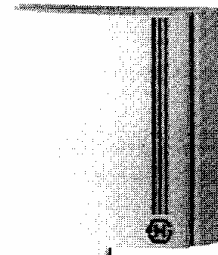
Frequency range	2300 – 2500 MHz
Impedance	50 Ω
VSWR	1.5
Polarization	circular (left or right)
Gain	8.5 dBi
3 dB beamwidth vertical	65°
3 dB beamwidth horizontal	70°
Axial ratio	3 dB
Front to back ratio	20 dB
Permitted power on entrance	75 W (CW) at 25 °C

Mechanical properties

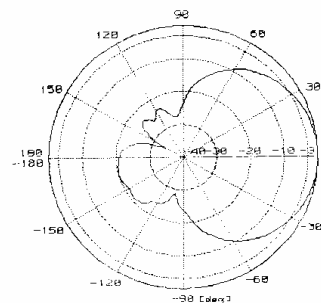
Dimensions	see overleaf
Weight	110 g
Housing material	ASA
Antenna color	RAL 7035 (grey)
Mounting bracket color	RAL 7042 (darkgrey)
Operating temperature range	- 40 °C to + 80 °C
Windload	30 N (200 km/h)

Available types

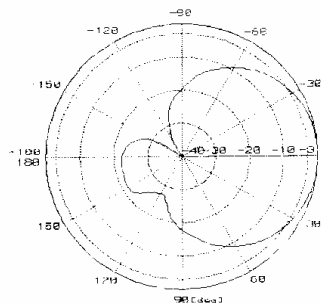
1324.19.0008 (rhcp)	SMA female
1324.19.0007 (lhcp)	SMA female
1324.26.0002 (rhcp)	TNC female
1324.26.0003 (lhcp)	TNC female



Radiation pattern



vertical



horizontal

Data Sheet 07.97/Edition 3, 231GHA/st

Waiver!
 While the information contained in this folder has been carefully compiled to the best of our present knowledge, it is not intended as representation or warranty of any kind on our part regarding the fitness of the products concerned for any particular use of purpose and neither shall any statement contained herein be construed as a recommendation to infringe any industrial property rights or as a license to use any such rights. The fitness of each product for any particular purpose must be checked beforehand with our specialists.

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Figure A-2: Planar antenna specifications

A.4 IMAGES OF THE LABORATORY MEASUREMENTS

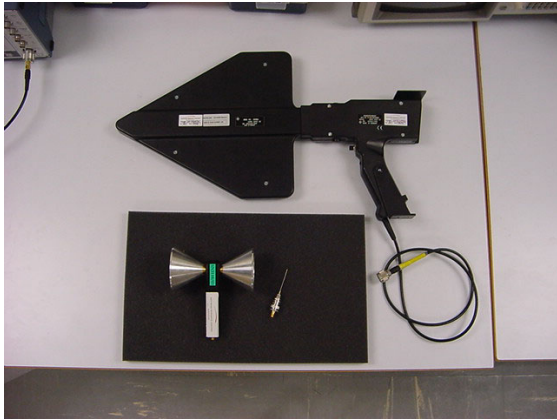


Figure A-3: Antennas used for the measurements



Figure A-6: Wire antenna $\lambda/4$

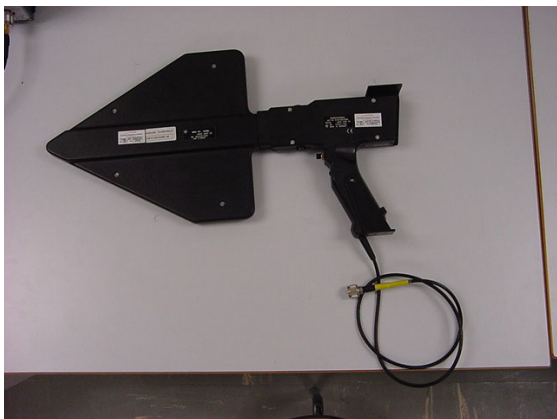


Figure A-4: Directional antenna

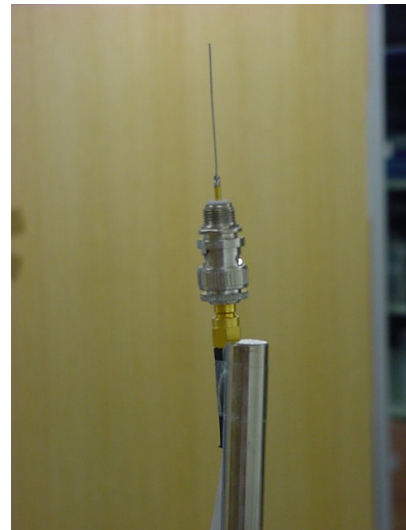


Figure A-7: Wire Antenna (2)

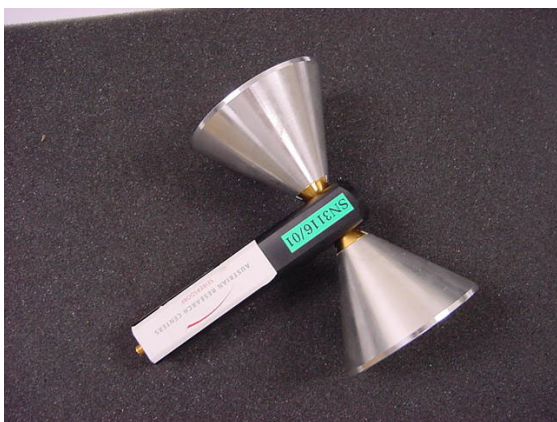


Figure A-5: Biconical antenna

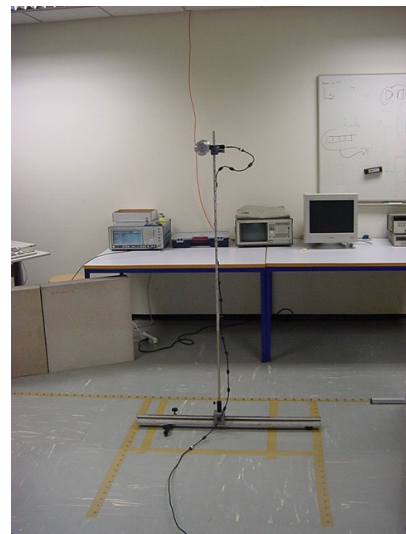


Figure A-8: Measurement of a room with biconical antenna



Figure A-9: Planar antennas setup

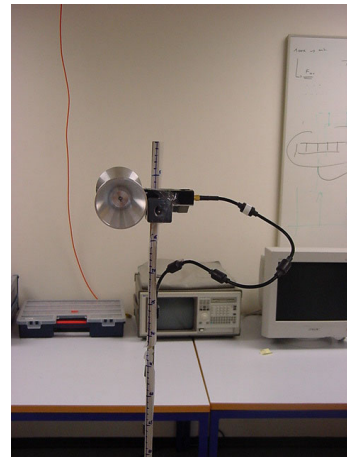


Figure A-12: Mapping of a room with biconical antenna



Figure A-10: Measurement with biconical antenna



Figure A-13: Biconical antenna polarization

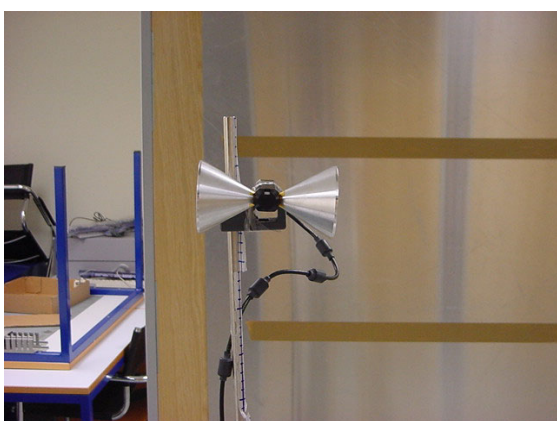


Figure A-11: Biconical antenna with reflecting panel



Figure A-14: "Schwenkmethode" with biconical antenna



Figure A-15: "Schwenkmethode" with biconical antenna (2)

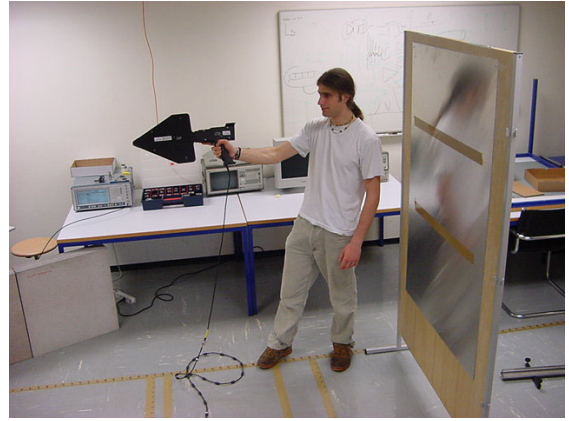


Figure A-17: "Schwenkmethode" with directional antenna (2)

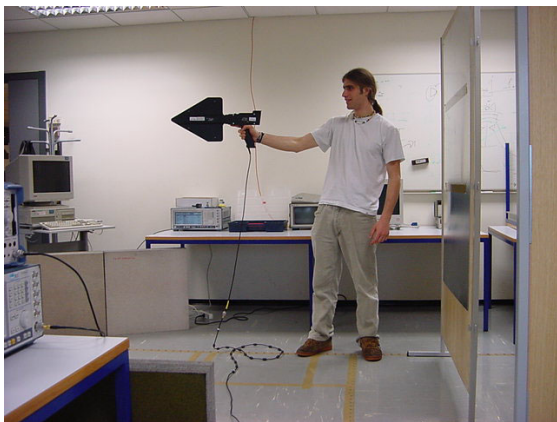


Figure A-16: "Schwenkmethode" with directional antenna



Figure A-18: "Schwenkmethode" with directional antenna (3)

APPENDIX B ON-SITE MEASUREMENTS

B.1 INSTRUMENTS COMPARISON TABLES

B.1.1 SPECTRAL POWER AND UMTS CHANNEL POWER COMPARISONS

Table B-1: Spectral measurements with RBW 5 MHZ - ITTI and BEGF

Instrument	Installation	Location	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Max-Min (dB)
instr#I	ITTI	Point 1 indoor	-30.69	-30.70	-30.39	-30.49	-30.31	-30.38	-30.49	0.39
		Point 2 indoor	-33.90	-33.87	-33.78	-33.92			-33.87	0.14
	BEGF	Point 1 indoor	-22.84	-22.73	-22.50	-22.72	-22.59	-22.64	-22.67	0.34
		Point 2 indoor	-23.71	-23.69	-23.04	-23.83	-23.71	-23.29	-23.54	0.79
instr#E	ITTI	Point 1 indoor	-30.90	-30.38	-30.87	-30.69	-30.54	-30.54	-30.65	0.52
		Point 2 indoor	-33.81	-33.98	-33.90	-33.87			-33.89	0.17
	BEGF	Point 1 indoor	-22.90	-22.95	-22.67	-22.77	-22.73	-22.56	-22.76	0.39
		Point 2 indoor	-23.71	-23.69	-23.04	-23.83	-23.71	-23.29	-23.54	0.79
		Point 1 outdoor	-24.11	-23.63	-24.09	-23.86	-23.89	-23.87	-23.91	0.48

Table B-2: UMTS channel power measurements - ITTI and BEGF

Instrument	Installation	Location	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Max-Min (dB)
instr#I	ITTI	Point 1 indoor			-32.54	-32.50	-32.50	-32.48	-32.50	0.06
		Point 2 indoor	-35.76	-35.66	-35.82	-35.61			-35.71	0.21
	BEGF	Point 1 indoor	-24.04	-24.50	-24.23	-24.19	-24.12	-24.19	-24.21	0.46
		Point 2 indoor	-25.16	-24.90	-25.19	-25.09	-25.23	-25.20	-25.13	0.33
instr#E	ITTI	Point 1 indoor	-32.87	-32.90	-33.75	-33.61	-33.50	-33.61	-33.36	0.88
		Point 2 indoor	-36.95	-36.95	-36.91	-36.98			-36.95	0.07
	BEGF	Point 1 indoor	-25.43	-25.45	-25.50	-25.44	-25.31	-25.34	-25.41	0.19
		Point 2 indoor	-26.23	-26.24	-26.30	-26.33	-26.30	-26.30	-26.28	0.10
instr#C	ITTI	Point 1 indoor								
		Point 2 indoor								
	BEGF	Point 1 indoor			-23.87	-23.94	-23.56	-23.81	-23.79	0.38
		Point 2 indoor	-24.40	-24.41	-24.48	-24.50	-24.18	-24.05	-24.33	0.45
		Point 1 outdoor								
instr#C	ITTI	Point 1 indoor	-32.60	-32.30	-32.40	-32.30	-32.20	-32.30	-32.35	0.40
		Point 2 indoor	-35.80	-35.70	-35.70	-35.50			-35.67	0.30
	BEGF	Point 1 indoor	-24.20	-24.20	-24.10	-24.20	-24.30	-24.20	-24.20	0.20
		Point 2 indoor	-25.30	-25.40	-25.80	-25.50	-25.60	-25.60	-25.53	0.50
		Point 1 outdoor	-25.80	-25.90	-25.70	-25.60	-25.80	-25.50	-25.71	0.40

B.1.2 UMTS CHANNEL POWER AND CPICH POWER COMPARISONS

Table B-3: UMTS channel power measurements

Instrument	Installation	Location	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Max-Min (dB)	
instr#C	ITTI	Point 1 indoor	-33.80	-33.90	-33.60	-33.60	-33.40	-33.40	-33.62	0.50	
		BEGF	Point 3 indoor	-24.30	-24.20	-24.90	-24.90	-24.40	-24.40	-24.52	0.70
		Point 4 indoor	-27.30	-27.20	-27.10	-27.20	-27.30	-27.30	-27.23	0.20	
		Point 5 indoor	-24.00	-24.10	-24.00	-24.10	-24.20	-24.10	-24.08	0.20	
		Point 2 outdoor	-25.60	-25.60	-25.60	-25.70	-25.60	-25.60	-25.62	0.10	
	KONI	Point 1 indoor	-56.90	-56.50	-56.60	-56.90				-56.73	0.40
		Point 2 indoor	-30.90	-30.90	-31.10	-31.10				-31.00	0.20
		Point 1 outdoor	-25.20	-25.20	-24.70	-24.90				-25.00	0.50
Point 2 outdoor		-29.40	-29.60	-29.70	-29.50				-29.55	0.30	
instr#E	BEGF	Point 3 indoor	-23.13	-23.17	-23.33	-23.36	-23.70	-23.17	-23.31	0.57	
		Point 4 indoor	-26.39	-26.36	-26.32	-26.40	-26.39	-26.38	-26.37	0.08	
		Point 5 indoor	-23.09	-23.04	-23.35	-23.57	-23.18	-23.54	-23.30	0.53	
		Point 2 outdoor	-24.18	-24.08	-24.18	-24.19	-24.14	-24.10	-24.15	0.11	
	KONI	Point 1 indoor	-55.89	-55.02	-55.44	-55.56				-55.48	0.87
		Point 2 indoor	-30.07	-30.23	-30.24	-30.26				-30.20	0.19
		Point 1 outdoor	-24.38	-24.45	-24.24	-24.14				-24.30	0.31
		Point 2 outdoor	-28.84	-29.08	-29.24	-28.88				-29.01	0.40

Table B-4: CPICH power measurements at BEGF

Instrument	SC	Location	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Max (dBm)	Max-Min (dBm)
instr#C	13	Point 3 indoor	-26.90	-26.80	-26.90	-27.00	-26.80	-27.00	-26.90	-26.80	0.20
		Point 4 indoor	-30.70	-30.60	-30.30	-30.50	-30.40	-30.30	-30.46	-30.30	0.40
		Point 5 indoor	-27.10	-27.10	-27.10	-27.30	-27.30	-27.30	-27.20	-27.10	0.20
	11	Point 4 indoor	-37.60	-37.60	-37.70	-37.60			-37.62	-37.60	0.10
		Point 5 indoor	-34.20	-34.20	-34.30	-34.00	-34.30	-34.30	-34.22	-34.00	0.30
	12	Point 1 outdoor	-28.00	-28.10	-28.00	-28.10	-28.00	-28.00	-28.03	-28.00	0.10
instr#E	13	Point 3 indoor	-26.99	-27.02	-27.27	-27.19	-27.05	-27.80	-27.21	-26.99	0.81
		Point 4 indoor	-30.05	-30.16	-30.57	-30.52	-30.13	-30.33	-30.29	-30.05	0.52
		Point 5 indoor	-27.24	-27.10	-27.24	-27.26	-27.20	-27.19	-27.20	-27.10	0.16
	11	Point 4 indoor	-36.80	-36.62	-37.37	-37.40	-37.47	-37.45	-37.17	-36.62	0.85
		Point 5 indoor	-34.19	-34.25	-34.11	-34.14	-34.10	-34.11	-34.15	-34.10	0.15
	12	Point 1 outdoor	-28.03	-28.07	-28.10	-28.06	-28.05	-28.04	-28.06	-28.03	0.07
instr#I	13	Point 3 indoor	-27.50	-27.34	-27.73	-27.45	-27.53	-27.06	-27.43	-27.06	0.67
		Point 4 indoor	-31.02	-30.91	-30.85	-30.95	-30.94	-31.40	-31.01	-30.85	0.55
		Point 5 indoor	-27.27	-27.31	-27.66	-27.89	-27.99	-28.03	-27.68	-27.27	0.76

Table B-5: CPICH power measurements at KONI

Instrument	SC	Location	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Average (dBm)	Max (dBm)	Max-Min (dBm)
instr#C	173	Point 1 indoor	-60.70	-61.40	-60.00	-60.10	-60.51	-60.00	1.40
		Point 2 indoor	-34.10	-34.10	-34.10	-34.10	-34.10	-34.10	0.00
		Point 1 outdoor	-27.90	-27.90	-27.70	-27.70	-27.80	-27.70	0.20
		Point 2 outdoor	-33.00	-32.90	-32.80	-32.50	-32.80	-32.50	0.50
	171	Point 1 indoor	-64.00	-63.90	-63.80	-64.30	-64.00	-63.80	0.50
		Point 2 indoor	-43.60	-43.40	-43.80	-43.70	-43.62	-43.40	0.40
instr#F	173	Point 1 indoor	-67.80	-68.70	-69.80	-68.70	-68.69	-67.80	2.00
		Point 2 indoor	-42.00	-41.90	-42.30	-42.30	-42.12	-41.90	0.40
		Point 1 outdoor	-34.40	-33.50	-34.00	-34.50	-34.08	-33.50	1.00
		Point 2 outdoor	-38.80	-39.30	-39.60	-43.10	-39.91	-38.80	4.30
	171	Point 1 indoor	-70.50	-71.70	-71.80	-70.20	-70.99	-70.20	1.60
	instr#D	173	Point 1 indoor	-60.29	-60.35	-60.65	-60.85	-60.53	-60.29
Point 2 indoor			-34.59	-34.58	-34.73	-34.76	-34.66	-34.58	0.18
Point 1 outdoor			-28.27	-28.43	-28.14	-28.12	-28.24	-28.12	0.31
Point 2 outdoor			-32.63	-32.77	-32.68	-32.74	-32.70	-32.63	0.14
171		Point 1 indoor	-64.26	-64.39	-64.13	-64.37	-64.29	-64.13	0.26
		Point 2 indoor	-43.34	-44.12	-43.83	-43.94	-43.80	-43.34	0.78
		Point 1 indoor	cannot synchronize						
		Point 2 indoor	-33.50	-33.50	-33.50	-33.50	-33.50	-33.50	0.00
instr#H	173	Point 1 outdoor	-29.30	-29.20	-29.20	-29.30	-29.25	-29.20	0.10
		Point 2 outdoor	-32.10	-32.00	-32.20	-32.20	-32.12	-32.00	0.20
		Point 1 indoor	cannot synchronize						
		Point 2 indoor	-42.8	-42.9	-42.19	-43.1	-42.73	-42.19	0.91
	171	Point 2 outdoor	-45.1	-45.5	-45.6	-45	-45.29	-45.00	0.60
		Point 2 outdoor	-45.1	-45.5	-45.6	-45	-45.29	-45.00	0.60

B.2 REPRODUCIBILITY MEASUREMENT TABLES

B.2.1 INSTALLATION BEFH

Table B-6: Reproducibility measurements - BEFH

Date	Measurement No.	PMM ¹ (E field)		instr#G (spectral power)			instr#C (UMTS channel power)			instr#C (CPICH power, SC153)		
		max. (V/m)	RMS (V/m)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)
02.apr.03	1	0.87	0.57	-42.61	0.36	0.33	-42.30	0.28	0.70	-44.10	0.10	2.30
	2	0.82	0.62	-42.28	0.69		-41.60	0.98		-46.40	2.40	
	3	0.87	0.58							-44.90	0.90	
03.apr.03	4	0.86	0.70	-43.42	0.45	0.47	-43.40	0.82	0.40	-44.60	0.60	1.70
	5	0.89	0.58	-42.95	0.02		-43.30	0.72		-45.60	1.60	
	6	0.88	0.52				-43.70	1.12		-43.90	0.10	
04.apr.03	7	0.88	0.53	-43.40	0.43	0.89	-42.60	0.02	0.10	-44.60	0.60	0.50
	8	0.89	0.54	-42.51	0.46		-42.50	0.08		-44.10	0.10	
	9	0.88	0.59							-44.10	0.10	
10.apr.03	10	0.90	0.60	-43.12	0.15	0.18	-43.10	0.52	1.00	-43.50	0.50	0.60
	11	0.82	0.58	-43.30	0.33		-42.10	0.48		-43.70	0.30	
	12	0.86	0.60				-42.80	0.22		-44.10	0.10	
17.apr.03	13	0.93	0.68	-43.12	0.15	0.14	-42.00	0.58	0.50	-44.20	0.20	3.10
	14	0.93	0.67	-42.98	0.01		-41.50	1.08		-41.10	2.90	
	15	0.86	0.63							-41.10	2.90	
mean value (dBm)		0.88 (V/m)	0.60 (V/m)	-42.97			-42.58			-44.00		
standard deviation (dB)		0.03 (V/m)	0.05 (V/m)	0.39			0.71			1.39		

¹⁾ PMM measurements were performed for 2-3 minutes; the "max" value represent the maximal value measured during the session, while "RMS" is the quadratic average of the sampling.

Table B-7: Other sources - BEFH

Band	Frequency (MHz)	Power _{carrier} (dBm)	nr. of carriers	E _{carrier} (V/m)	E _{carriers} (V/m)	Measurement uncertainty (V/m)	E _{carriers} incl. meas. uncertainty (V/m)
GSM1800	1809.2	-39.64	1	0.025	0.025	0.009	0.034
	1812.8	-32.93	1	0.054	0.054	0.019	0.073
	1825.2	-22.14	1	0.187	0.187	0.066	0.253
	1826.6	-30.64	1	0.070	0.070	0.025	0.095
	1845.0	-43.21	2	0.017	0.023	0.008	0.032
	1847.6	-17.97	2	0.303	0.428	0.150	0.578
	1848.0	-48.1	2	0.009	0.013	0.005	0.018
GSM900	935.2	-20.33	3	0.093	0.161	0.056	0.217
	935.6	-28.11	2	0.038	0.054	0.019	0.072
	937.0	-3.38	1	0.654	0.654	0.229	0.883
	937.8	-33.51	2	0.020	0.029	0.010	0.039
	948.0	-35.62	2	0.016	0.023	0.008	0.031
	948.4	-40.05	2	0.010	0.014	0.005	0.018
	949.8	-49.91	2	0.003	0.004	0.002	0.006
	952.2	-24.46	2	0.058	0.082	0.029	0.110
Radio	94.8	-34.72	7	0.013	0.034	0.012	0.045
TPE/TPS	147.0	-32.05	1	0.012	0.012	0.004	0.016
	169.0	-28.29	1	0.018	0.018	0.006	0.024
TV	209.0	-28.34	1	0.068	0.068	0.024	0.092
	215.0	-38.52	1	0.021	0.021	0.007	0.028
	450.0	-37.92	1	0.018	0.018	0.006	0.024
total					0.836	0.293	1.129
total for GSM					0.832	0.291	1.123
total for TPE/TPS					0.022	0.008	0.029
total for Radio + TV					0.081	0.028	0.109

B.2.2 INSTALLATION ITTI

Table B-8: Reproducibility measurements - ITTI

Date	Measurement No.	PMM (E field)		instr#G (spectral power)			instr#C (UMTS channel power)			instr#C (CPICH power)		
		max. (V/m)	RMS (V/m)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)
02.apr.03	1	0.89	0.24	-38.43	1.19	1.97	-39.00	2.68	2.20	-37.40	0.20	1.10
	2	0.83	0.40	-36.46	0.78		-36.80	0.48		-37.00	0.20	
	3	0.91	0.43	-38.38	1.14		-38.40	2.08		-36.30	0.90	
03.apr.03	4	0.91	0.50	-37.25	0.01	1.26	-34.90	1.42	2.50	-37.30	0.10	2.00
	5	1.02	0.59	-36.62	0.62		-37.40	1.08		-37.20	0.00	
	6	0.97	0.48	-35.99	1.25		-36.40	0.08		-39.20	2.00	
04.apr.03	7	0.90	0.44	-38.36	1.12	2.32	-34.30	2.02	2.50	-37.00	0.20	1.40
	8	0.85	0.45	-37.64	0.40		-33.60	2.72		-37.40	0.20	
	9	0.93	0.54	-36.04	1.20		-36.10	0.22		-36.00	1.20	
mean value (dBm)		0.91 (V/m)	0.45 (V/m)	-37.24			-36.32			-37.20		
standard deviation (dB)		0.06 (V/m)	0.10 (V/m)	1.01			1.82			0.90		

Table B-9: Other sources - ITTI

Band	Frequency (MHz)	Power _{carrier} (dBm)	nr. of carriers	E _{carrier} (V/m)	E _{carriers} (V/m)	Measurement uncertainty (V/m)	E _{carriers} incl. meas. uncertainty (V/m)
GSM1800	1814.4	-42.84	2	0.017	0.024	0.009	0.033
	1814.8	-15.83	2	0.387	0.548	0.192	0.739
	1817.8	-40.12	2	0.024	0.033	0.012	0.045
	1844.4	-37.43	2	0.032	0.046	0.016	0.061
	1846.6	-21.66	2	0.198	0.280	0.098	0.378
	1848.4	-49.73	2	0.008	0.011	0.004	0.015
GSM900	937.2	-19.10	2	0.107	0.151	0.053	0.204
	937.8	-36.06	2	0.015	0.021	0.008	0.029
	948.4	-35.16	2	0.017	0.024	0.008	0.032
	949.2	-47.46	2	0.004	0.006	0.002	0.008
TPE/TPS	147	-27.60	1	0.020	0.020	0.007	0.027
	169	-19.78	1	0.048	0.048	0.017	0.065
TV	209	-35.83	1	0.029	0.029	0.010	0.039
	479	-38.71	1	0.016	0.016	0.006	0.022
	450	-32.72	1	0.033	0.033	0.011	0.044
total					0.641	0.224	0.865
total for GSM					0.637	0.223	0.860
total for TPE/TPS					0.052	0.018	0.070
total for TV					0.046	0.016	0.063

B.2.3 INSTALLATION BEGF

Table B-10: Reproducibility measurements - BEGF

Date	Measurement No.	PMM (E field)		instr#G (spectral power)			instr#C (UMTS channel power)			instr#C (CPICH power, SC 13)		
		max. (V/m)	RMS (V/m)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)
09.apr.03	1	1.08	0.64	-25.90	0.41	0.18	-21.70	0.65	1.30	-24.90	0.18	0.60
	2	1.14	0.54	-25.86	0.38		-21.90	0.45		-25.10	0.38	
	3	1.12	0.60	-25.72	0.23		-23.00	0.65		-25.50	0.78	
10.apr.03	4	1.19	0.65	-24.86	0.63	0.76	-22.30	0.05	0.50	-23.70	1.02	0.90
	5	1.15	0.68	-24.95	0.54		-22.40	0.05		-24.60	0.12	
	6	1.13	0.62	-25.62	0.14		-22.80	0.45		-24.50	0.22	
11.apr.03	7	1.13	0.51	-24.39		1.17	-20.60		0.90	-21.10		0.70
	8	1.11	0.61	-23.51			-19.90			-21.80		
	9	1.03	0.59	-23.22			-19.70			-21.70		
mean value (dBm)		1.14 (V/m)	0.62 (V/m)	-25.49			-22.35			-24.72		
standard deviation (dB)		0.04 (V/m)	0.05 (V/m)	0.46			0.50			0.61		

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- increase of 3dB on 2 channels (11,13)
- increase of 5dB on 1 channel (12)

Remarks: **mean value** and **std. deviation** are calculated without the highlighted values.

Table B-11: Other sources - BEGF

Band	Frequency (MHz)	Power _{carrier} (dBm)	nr. of carriers	E _{carrier} (V/m)	E _{carriers} (V/m)	Measurement ncertainty (V/m)	E _{carriers} incl. meas. uncertainty (V/m)
GSM1800	1806.0	-36.39	2	0.036	0.051	0.018	0.069
	1811.4	-47.04	2	0.011	0.015	0.005	0.020
	1820.4	-28.83	2	0.087	0.123	0.043	0.166
	1828.6	-16.46	2	0.360	0.509	0.178	0.688
	1844.0	-45.97	2	0.012	0.017	0.006	0.023
	1846.2	-35.46	2	0.040	0.057	0.020	0.077
	1846.8	-38.82	2	0.027	0.039	0.014	0.052
	1848.2	-32.38	2	0.058	0.081	0.029	0.110
GSM900	935.2	-16.46	2	0.145	0.205	0.072	0.277
	936.4	-28.36	2	0.037	0.052	0.018	0.070
	938.0	-16.00	2	0.153	0.216	0.076	0.292
	954.6	-39.13	2	0.011	0.015	0.005	0.020
Radio	100.0	-41.77	1	0.006	0.006	0.002	0.008
TPE/TPS	147.0	-39.01	1	0.005	0.005	0.002	0.007
	169.0	-25.86	1	0.024	0.024	0.008	0.032
total					0.618	0.216	0.834
total for GSM					0.617	0.216	0.833
total for TPE/TPS					0.024	0.009	0.033
total for Radio					0.006	0.002	0.008

B.2.4 INSTALLATION KONI

Table B-12: Reproducibility measurements - KONI

Date	Measurement No.	PMM (E field)		instr#G (spectral power)			instr#C (UMTS channel power)			instr#C (CPICH power, SC 173)		
		max. (V/m)	RMS (V/m)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)	P (dBm)	deviation from mean value (dB)	daily variation range (dB)
16.apr.03	1	0.64	0.40	-36.55	0.28	0.84	-32.50	0.08	0.10	-35.20	0.15	0.60
	2	0.75	0.48	-36.67	0.40		-32.40	0.02		-35.60	0.55	
	3	0.79	0.48	-35.83	0.44		-32.50	0.08		-35.00	0.05	
17.apr.03	4	0.74	0.38	-36.11	0.16	0.93	-32.60	0.18	0.90	-35.50	0.45	1.80
	5	0.64	0.42	-36.69	0.42		-31.80	0.62		-33.70	1.35	
	6	0.70	0.42	-35.76	0.51		-32.70	0.28		-35.30	0.25	
mean value (dBm)		0.71 (V/m)	0.43 (V/m)	-36.27			-32.42			-35.05		
standard deviation (dB)		0.06 (V/m)	0.04 (V/m)	0.42			0.32			0.69		

Table B-13: Other sources - KONI (indoor)

Band	Frequency (MHz)	Power _{carrier} (dBm)	nr. of carriers	E _{carrier} (V/m)	E _{carriers} (V/m)	Measurement uncertainty (V/m)	E _{carriers} incl. meas. uncertainty (V/m)
GSM900	935.2	-26.37	2	0.046	0.066	0.023	0.088
	936.0	-34.86	2	0.017	0.025	0.009	0.033
	936.8	-13.33	2	0.208	0.294	0.103	0.397
	937.8	-41.42	2	0.008	0.012	0.004	0.016
Radio	101.0	-43.26	1	0.005	0.005	0.002	0.006
TPE/TPS	147.0	-12.21	1	0.116	0.116	0.041	0.156
	169.0	-12.17	1	0.115	0.115	0.040	0.155
TV	210.0	-35.44	1	0.030	0.030	0.011	0.041
	215.0	-46.78	1	0.008	0.008	0.003	0.011
	450.0	-27.71	1	0.058	0.058	0.020	0.078
total					0.350	0.123	0.473
total for GSM					0.303	0.106	0.408
total for TPE/TPS					0.163	0.057	0.220
total for Radio + TV					0.066	0.023	0.089

Table B-14: Other sources - KONI (outdoor)

Band	Frequency (MHz)	Power _{carrier} (dBm)	nr. of carriers	E _{carrier} (V/m)	E _{carriers} (V/m)	Measurement uncertainty (V/m)	E _{carriers} incl. meas. uncertainty (V/m)
GSM1800	1821.6	-32.89	2	0.054	0.077	0.027	0.104
GSM900	935.2	-22.91	2	0.069	0.098	0.034	0.132
	936.0	-28.27	2	0.037	0.053	0.018	0.071
	936.8	-6.28	2	0.468	0.662	0.232	0.894
	937.8	-36.50	2	0.014	0.020	0.007	0.028
Radio	101.0	-27.34	2	0.030	0.042	0.015	0.057
TPE/TPS	147.0	-15.18	1	0.082	0.082	0.029	0.111
	169.0	0.29	1	0.483	0.483	0.169	0.652
total					0.836	0.293	1.129
total for GSM					0.672	0.235	0.907
total for TPE/TPS					0.490	0.172	0.662
total for Radio + TV					0.088	0.031	0.118

B.3 CPICH POWER AND UMTS CHANNEL POWER COMPARISON TABLES

The installations transmitted only common channels. Since no traffic channels were present, it is possible to calculate the total field strength of a cell by numerically correcting the measured CPICH's power. A correction factor is applied which takes into account all the common channels transmitted by the cell (SCH and BCH). For the investigated installations the power of the each common channel is fixed relative to the CPICH's power (table B-15).

table B-15: Power of common channels

Channel	Power [dBm]
P_{CPICH}	x
P_{P_SCH}	x - 1.8 (dB)
P_{S_SCH}	x - 3.5 (dB)
P_{BCH}	x - 3.1 (dB)

Correction factor when SCH is transmitted:

$$k_{P1} = P_{TOT} - P_{CPICH} = 10 \cdot \log\left(10^{\frac{x}{10}} + 10^{\frac{x-1.8}{10}} + 10^{\frac{x-3.5}{10}}\right) - 10 \cdot \log\left(10^{\frac{x}{10}}\right) = 3.24 [dB] \quad (B.1)$$

Correction factor when BCH is transmitted:

$$k_{P2} = P_{TOT} - P_{CPICH} = 10 \cdot \log\left(10^{\frac{x}{10}} + 10^{\frac{x-3.1}{10}}\right) - 10 \cdot \log\left(10^{\frac{x}{10}}\right) = 1.73 [dB] \quad (B.2)$$

Time weighted correction factor (10% SCH; 90% BCH¹):

$$k_P = 1.91 [dB], \text{ for correction of the measured power;} \quad (B.3)$$

$$k_E = 10^{\frac{k_P}{20}} = 1.25, \text{ for correction of the field strength.} \quad (B.4)$$

¹ The Synchronization Channel (SCH) is needed for the acquisition of the cells transmitted signal synchronism and consists of two channels: the primary and the secondary synchronization channel. Primary and secondary SCH are transmitted in parallel. The SCH channel is multiplexed in time with the Primary Common Control Physical Channel (P_CCPCH); for its transmission 256 chips of the 2560 chips of each slot are dedicated. The primary CCPCH is the physical channel which transports the Broadcast Channel (BCH).

Table B-16: Comparison between UMTS channel power and code domain power measurements

Installation	Location	instr#E ¹	instr#C	instr#C					instr#F					instr#D					instr#H					instr#I				
		instr#D ²	(reference)	CPICH power					CPICH power					CPICH power					CPICH power					CPICH power				
		P _{UMTSchannel} (dBm)	P _{UMTSchannel} (dBm)	P _{SC1} (dBm)	P _{SC1,k} (dBm)	P _{SC2} (dBm)	P _{SC2,k} (dBm)	ΣP _{SCn,k} (dBm)	P _{SC1} (dBm)	P _{SC1,k} (dBm)	P _{SC2} (dBm)	P _{SC2,k} (dBm)	ΣP _{SCn,k} (dBm)	P _{SC1} (dBm)	P _{SC1,k} (dBm)	P _{SC2} (dBm)	P _{SC2,k} (dBm)	ΣP _{SCn,k} (dBm)	P _{SC1} (dBm)	P _{SC1,k} (dBm)	P _{SC2} (dBm)	P _{SC2,k} (dBm)	ΣP _{SCn,k} (dBm)	P _{SC1} (dBm)	P _{SC1,k} (dBm)	P _{SC2} (dBm)	P _{SC2,k} (dBm)	ΣP _{SCn,k} (dBm)
ITTI	Point 1		-33.62	-36.47	-34.56																							
BEGF	Point 3	-23.31 ¹	-24.52	-26.90	-24.99							-27.22	-25.31				-25.31							-27.44	-25.53			-25.53
	Point 4	-26.37 ¹	-27.23	-30.47	-28.56	-37.63	-35.72	-27.79					-30.29	-28.38	-37.19	-35.28	-27.58							-31.01	-29.10			-29.10
	Point 5	-23.30 ¹	-24.08	-27.20	-25.29	-34.22	-32.31	-24.50					-27.21	-25.30	-34.15	-32.24	-24.50							-27.69	-25.78			-25.78
	Point 2 outdoor	-24.15 ¹	-25.62	-28.03	-26.12			-26.12					-28.06	-26.15			-26.15											
KONI	Point 1	-55.48 ²	-56.73	-60.55	-58.64	-64.00	-62.09	-57.02	-68.75	-66.84	-71.05	-69.14	-64.83	-60.54	-58.63	-64.29	-62.38	-57.10										
	Point 2	-30.20 ²	-31.00	-34.10	-32.19	-43.63	-41.72	-31.73	-42.13	-40.22			-40.22	-34.67	-32.76	-43.81	-41.90	-32.26	-33.50	-31.59	-42.75	-40.84	-31.10					
	Point 1 outdoor	-24.30 ²	-25.00	-27.80	-25.89			-25.89	-34.10	-32.19			-32.19	-28.24	-26.33			-26.33	-29.25	-27.34				-27.34				
	Point 2 outdoor	-29.01 ²	-29.55	-32.80	-30.89			-30.89	-40.20	-38.29			-38.29	-32.71	-30.80			-30.80	-32.13	-30.22	-45.30	-43.39	-30.01					

Where: P_{SCn} are the P_{P_CPICH} decoded by scrambling code n measured on a UMTS channel,
 $P_{SCn,k}$ is P_{SCn} + correction factor for SCH and BCH channels,
 $\Sigma P_{SCn,k}$ is total channel power including P_CPICH_n , P_SCH_n , S_SCH_n , BCH_n .

B.4 SCHWENKMETHODE TABLES

The measurement locations and the fixed point coordinates are described in chapter 12.1.

Table B-17: BEGF point 1, indoor - channel power and spectral power measurements

Meas. type / instrument		Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 1	instr#G, spectral power	-26.60	-27.60	-25.50	-27.00	-26.20	-25.70	-26.43	0.80
	instr#E, spectral power, RBW=1MHZ	-26.77	-25.95	-25.49	-26.31	-24.76	-25.23	-25.75	0.74
	instr#E, spectral power, RBW=5MHZ	-19.80	-22.16	-22.19	-21.37	-21.99	-20.57	-21.35	0.98
	instr#C, channel power	-23.60	-23.00	-24.20	-23.60	-23.80	-23.30	-23.58	0.41
	instr#E, channel power, RBW=5MHZ	-23.08	-23.61	-23.60	-23.32	-23.18	-22.28	-23.18	0.49
Point 1 (fixed)	instr#G, spectral power	-27.10	-27.10	-27.50	-26.90	-27.10	-27.10	-27.13	0.20
	instr#E, spectral power, RBW=1MHZ	-27.43	-27.39	-27.29	-27.26	-27.22	-27.30	-27.32	0.08
	instr#E, spectral power, RBW=5MHZ	-22.90	-22.95	-22.67	-22.77	-22.73	-22.56	-22.76	0.14
	instr#C, channel power	-24.20	-24.20	-24.10	-24.20	-24.30	-24.20	-24.20	0.06
	instr#E, channel power, RBW=5MHZ			-23.87	-23.94	-23.56	-23.81	-23.80	0.17

Table B-18: BEGF point 1, outdoor - channel power and spectral power measurements

Meas. type / instrument		Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 1	instr#C, channel power	-22.80	-23.20	-23.30	-22.80	-22.90	-22.80	-22.97	0.23
	instr#G, spectral power	-26.70	-27.30	-26.70	-26.00	-26.30	-25.70	-26.45	0.57
	instr#E, spectral power, RBW=1MHZ	-25.64	-24.44	-25.66	-25.57	-25.26	-25.80	-25.40	0.50
	instr#E, spectral power, RBW=5MHZ	-21.97	-21.75	-21.74	-21.09	-21.14	-21.98	-21.61	0.40
Point 1(fixed)	instr#C, channel power	-25.80	-25.90	-25.70	-25.60	-25.80	-25.50	-25.72	0.15
	instr#G, spectral power	-27.50	-27.60	-27.10	-27.00	-27.30	-27.70	-27.37	0.28
	instr#E, spectral power, RBW=1MHZ	-28.19	-28.15	-27.89	-27.96	-27.91	-28.06	-28.03	0.13
	instr#E, spectral power, RBW=5MHZ	-24.11	-23.63	-24.09	-23.86	-23.89	-23.87	-23.91	0.18

Table B-19: BEGF point 3, indoor - channel power and CPICH power measurements

Meas. type / instrument		Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 3	instr#C, CPICH power, SC 13	-23.80	-21.50	-22.30	-21.60	-23.20	-23.10	-22.58	0.93
	instr#C, channel power	-19.50	-21.40	-19.80	-19.00	-20.50	-20.50	-20.12	0.86
	instr#E, channel power	-17.34	-19.06	-19.92	-19.54	-19.45	-19.32	-19.11	0.91
Point 3 (fixed)	instr#C, CPICH power, SC 13	-26.90	-26.80	-26.90	-27.00	-26.80	-27.00	-26.90	0.09
	instr#C, channel power	-24.30	-24.20	-24.90	-24.90	-24.40	-24.40	-24.52	0.31
	instr#E, channel power	-23.13	-23.17	-23.33	-23.36	-23.70	-23.17	-23.31	0.21

Table B-20: BEGF point 2, outdoor - channel power and CPICH power measurements

Meas. type / instrument		Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Meas. 5 (dBm)	Meas. 6 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 2	instr#C, CPICH power, SC 12	-25.4	-25.2	-25.1	-25.5	-25.8	-25.6	-25.43	0.26
	instr#C, channel power	-23.4	-22.9	-23.6	-23.4	-23.1	-23.1	-23.25	0.26
Point 2 (fixed)	instr#C, CPICH power, SC 12	-28.0	-28.1	-28.0	-28.1	-28.0	-28.0	-28.03	0.05
	instr#C, channel power	-25.6	-25.6	-25.6	-25.7	-25.6	-25.6	-25.62	0.04

Table B-21: ITTI point 2, indoor - channel power and spectral power measurements

Meas. type / instrument		Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 2	instr#C, channel power	-35.90	-36.00	-35.10	-35.60	-35.65	0.40
	instr#G, spectral power	-37.30	-38.30	-36.60	-37.10	-37.33	0.71
	instr#E, spectral power, RBW=1MHZ	-36.67	-37.10	-36.59	-36.98	-36.84	0.24
	instr#E, spectral power, RBW=5MHZ	-31.12	-32.19	-30.30	-31.50	-31.28	0.79
Point 2 (fixed)	instr#C, channel power	-35.80	-35.70	-35.70	-35.50	-35.68	0.13
	instr#G, spectral power	-38.18	-38.40	-37.80	-38.18	-38.14	0.25
	instr#E, spectral power, RBW=1MHZ	-38.09	-38.23	-38.01	-37.98	-38.08	0.11
	instr#E, spectral power, RBW=5MHZ	-33.81	-33.98	-33.90	-33.87	-33.89	0.07

Table B-22: KONI point 1, outdoor - channel power and CPICH power measurements

	Meas. type / instrument	Meas. 1 (dBm)	Meas. 2 (dBm)	Meas. 3 (dBm)	Meas. 4 (dBm)	Average (dBm)	Standard deviation (dB)
Schwenkmethode around point 1	instr#C, CPICH power, SC 173	-26.50	-26.80	-26.80	-27.30	-26.85	0.33
	instr#H, CPICH power, SC 171	-45.70	-45.80	-44.40	-45.30	-45.30	0.64
	instr#H, CPICH power, SC 172	-55.40	-55.10	-54.00	-55.70	-55.05	0.74
	instr#H, CPICH power, SC 173	-28.90	-28.80	-28.60	-29.10	-28.85	0.21
	instr#F, CPICH power, SC 173	-34.20	-33.60	-35.80	-35.70	-34.83	1.10
	instr#D, channel power	-24.00	-24.16	-23.72	-23.99	-23.97	0.18
	instr#C, channel power	-25.50	-25.40	-25.40	-24.80	-25.28	0.32
	Point 1 (fixed)	instr#C, CPICH power, SC 173	-27.90	-27.90	-27.70	-27.70	-27.80
instr#H, CPICH power, SC 171		cannot synchronize					
instr#H, CPICH power, SC 172		cannot synchronize					
instr#H, CPICH power, SC 173		-29.30	-29.20	-29.20	-29.30	-29.25	0.06
instr#F, CPICH power, SC 173		-34.40	-33.50	-34.00	-34.50	-34.10	0.45
instr#D, channel power		-24.38	-24.45	-24.24	-24.14	-24.30	0.14
instr#C, channel power		-25.20	-25.20	-24.70	-24.90	-25.00	0.24