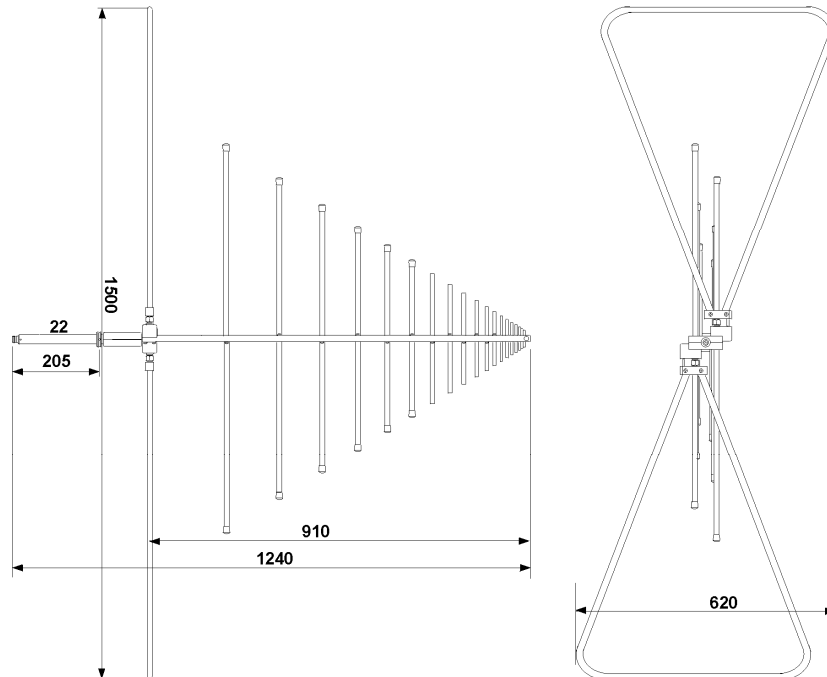


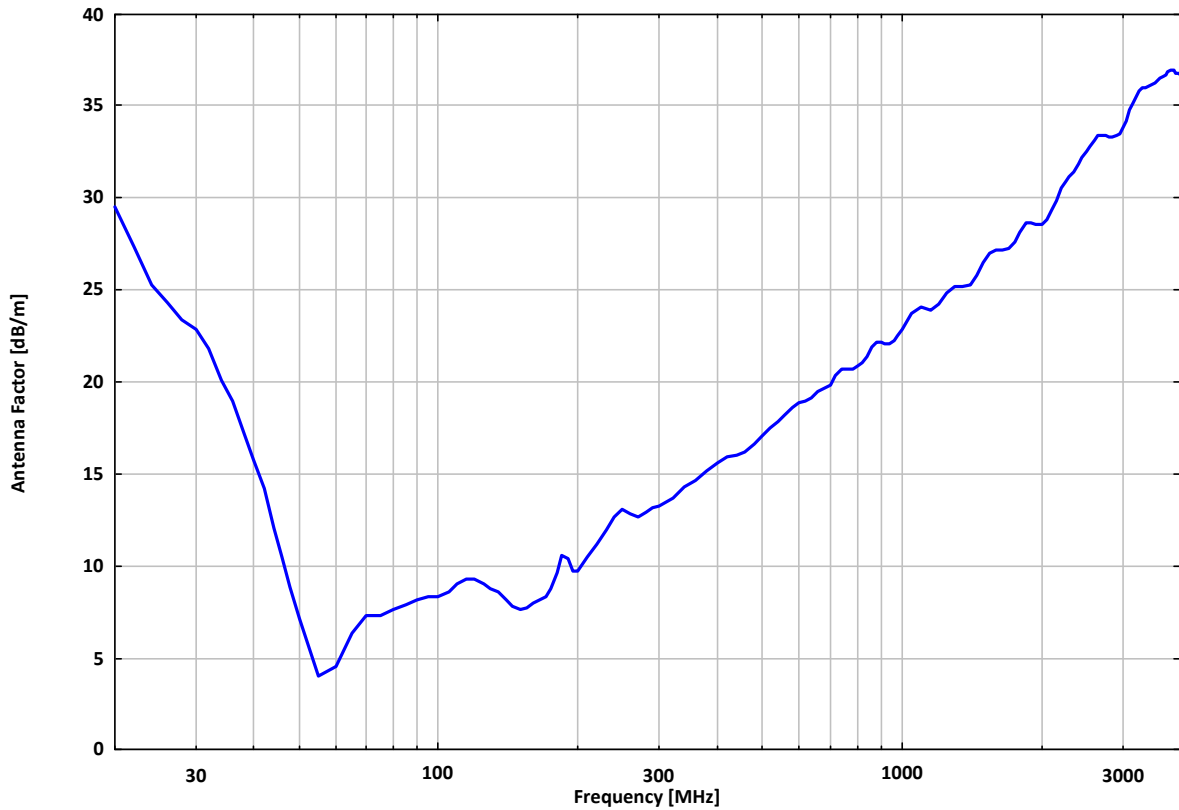
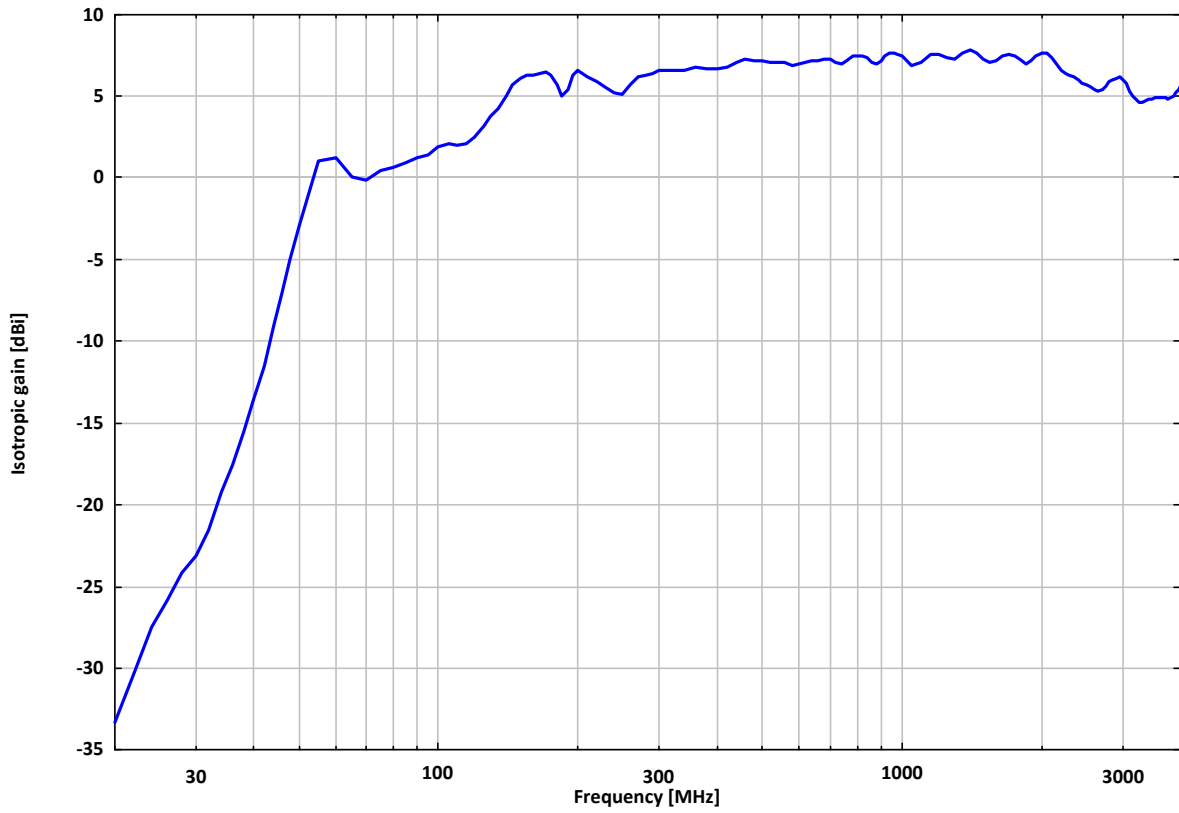
## Breitband-Hybridantenne Broadband Hybrid Antenna



Technische Daten:	VULB 9164	Specifications:
Bauart: Linear polarisierte Logarithmisch Periodische Breitbandantenne mit Breitbanddipol (Hybridantenne) in Aluminiumausführung für Empfangs- und Sendeanwendungen		Type: Linear polarized Logarithmic Periodic Broadband Antenna combined with a Broadband Dipole (Hybrid Antenna) made of Aluminum for Receive and Transmit Applications
Frequenzbereich, nominell:	30 MHz...3 GHz	Nominal Frequency Range:
Nutzbarer Frequenzbereich:	25 MHz ... 4 GHz	Usable Frequency Range:
Isotropgewinn im LP-Bereich:	6.4+/- 1.2 dBi	Isotropic Gain (LP-Section):
Antennenfaktor:	4 ... 37 dB/m	Antenna Factor:
Impedanz, nominell:	50 Ω	Nominal Impedance:
Stehwellenverhältnis SWR typisch:	< 1.5 ( 150 - 2000 MHz)	Standing Wave Ratio SWR typical:
Vor- Rückverhältnis:	20 dB (f > 150 MHz)	Front to Back Ratio:
Polarisationsentkopplung:	>20 dB (30 MHz...1 GHz)	Cross Polarisation:
3 dB Öffnungswinkel typ.(E-Ebene):	45°-65° (f > 150 MHz)	3 dB Beamwidth typ. (E-Plane):
3 dB Öffnungswinkel typ.(E-Ebene):	≈78° (f < 150 MHz)	3 dB Beamwidth typ. (E-Plane):
3 dB Öffnungswinkel typ.(H-Ebene):	90°-120° (f > 150 MHz)	3 dB Beamwidth typ. (H-Plane):
Max. Eingangsleistung:	1 kW (f < 100 MHz)	Max. Input Power:
Anschlußart: N-Buchse		N-Connector female
Halterung: 22 mm Rohr, Rastring		Mount: 22 mm Tube, Indexing Ring
Breite x Länge x Dicke:	1500 x 910 (1238) x 620 mm	Width x Length x Thickness:
Gewicht:	2.9 kg	Weight:



Fernfelddaten / Farfield Data



## Fernfelddaten / Farfield Data

Frequency	Distance	Wavelength	Attenuation	Gain (Isotr.)	Gain (Dipole)	Ant.-Factor
MHz	m	m	dB	dBi	dBd	dB/m
20.00	5.10	15.00	79.18	-33.28	-35.44	29.53
22.00	5.10	13.64	73.99	-30.28	-32.43	27.34
24.00	5.10	12.50	69.19	-27.50	-29.65	25.32
26.00	5.10	11.54	66.46	-25.78	-27.93	24.30
28.00	5.10	10.71	63.89	-24.17	-26.33	23.34
30.00	5.10	10.00	62.35	-23.11	-25.26	22.87
32.00	5.10	9.38	59.74	-21.52	-23.67	21.85
34.00	5.10	8.82	55.71	-19.24	-21.40	20.09
36.00	5.10	8.33	52.87	-17.57	-19.73	18.92
38.00	5.10	7.89	49.08	-15.45	-17.60	17.26
40.00	5.10	7.50	45.70	-13.53	-15.68	15.79
42.00	5.10	7.14	42.08	-11.51	-13.66	14.19
44.00	5.10	6.82	37.45	-8.99	-11.14	12.08
46.00	5.10	6.52	33.87	-7.01	-9.16	10.49
48.00	5.10	6.25	30.25	-5.01	-7.17	8.86
50.00	5.10	6.00	26.36	-2.90	-5.05	7.09
55.00	5.10	5.45	19.30	1.05	-1.10	3.98
60.00	5.10	5.00	19.68	1.24	-0.91	4.55
65.00	5.10	4.62	22.69	0.08	-2.07	6.40
70.00	5.10	4.29	23.87	-0.19	-2.34	7.31
75.00	5.10	4.00	23.28	0.41	-1.75	7.32
80.00	5.10	3.75	23.46	0.60	-1.55	7.68
85.00	5.10	3.53	23.35	0.92	-1.23	7.89
90.00	5.10	3.33	23.33	1.18	-0.98	8.13
95.00	5.10	3.16	23.27	1.44	-0.71	8.34
100.00	5.10	3.00	22.87	1.86	-0.29	8.36
105.00	5.10	2.86	22.95	2.03	-0.12	8.61
110.00	5.10	2.73	23.37	2.02	-0.13	9.02
115.00	5.10	2.61	23.58	2.12	-0.04	9.32
120.00	5.10	2.50	23.22	2.48	0.33	9.32
125.00	5.03	2.40	22.12	3.14	0.99	9.02
130.00	4.96	2.31	21.07	3.78	1.63	8.72
135.00	4.90	2.22	20.33	4.26	2.11	8.57
140.00	4.84	2.14	19.05	5.01	2.86	8.13
145.00	4.79	2.07	17.95	5.66	3.51	7.78
150.00	4.74	2.00	17.35	6.07	3.91	7.68
155.00	4.69	1.94	17.14	6.27	4.12	7.76
160.00	4.65	1.88	17.27	6.30	4.15	8.00
165.00	4.61	1.82	17.31	6.37	4.22	8.20
170.00	4.57	1.76	17.30	6.48	4.32	8.35
175.00	4.53	1.71	17.85	6.29	4.14	8.79
180.00	4.50	1.67	19.15	5.73	3.58	9.60
185.00	4.47	1.62	20.75	5.02	2.87	10.55
190.00	4.43	1.58	20.15	5.40	3.25	10.39
195.00	4.41	1.54	18.54	6.29	4.14	9.73
200.00	4.38	1.50	18.26	6.51	4.36	9.73
210.00	4.33	1.43	19.31	6.15	4.00	10.51
220.00	4.28	1.36	20.18	5.87	3.72	11.20
230.00	4.24	1.30	21.33	5.44	3.29	12.01
240.00	4.20	1.25	22.19	5.16	3.01	12.67
250.00	4.16	1.20	22.69	5.05	2.89	13.13
260.00	4.13	1.15	21.62	5.72	3.57	12.80



Frequency	Distance	Wavelength	Attenuation	Gain (Isotr.)	Gain (Dipole)	Ant-Factor
MHz	m	m	dB	dBi	dBd	dB/m
270.00	4.10	1.11	20.90	6.21	4.06	12.64
280.00	4.07	1.07	21.05	6.26	4.11	12.90
290.00	4.04	1.03	21.16	6.33	4.18	13.14
300.00	4.02	1.00	21.04	6.51	4.36	13.25
320.00	3.97	0.94	21.34	6.59	4.44	13.73
340.00	3.93	0.88	21.79	6.59	4.43	14.26
360.00	3.90	0.83	21.89	6.74	4.59	14.60
380.00	3.86	0.79	22.44	6.67	4.52	15.15
400.00	3.84	0.75	22.91	6.62	4.47	15.64
420.00	3.81	0.71	23.09	6.72	4.57	15.97
440.00	3.79	0.68	22.75	7.06	4.91	16.03
460.00	3.76	0.65	22.67	7.27	5.12	16.21
480.00	3.74	0.63	23.17	7.18	5.03	16.66
500.00	3.73	0.60	23.48	7.18	5.03	17.02
520.00	3.71	0.58	23.99	7.08	4.93	17.46
540.00	3.69	0.56	24.35	7.05	4.89	17.82
560.00	3.68	0.54	24.67	7.03	4.87	18.16
580.00	3.67	0.52	25.19	6.91	4.75	18.58
600.00	3.65	0.50	25.40	6.93	4.78	18.85
620.00	3.64	0.48	25.31	7.10	4.95	18.96
640.00	3.63	0.47	25.42	7.17	5.02	19.17
660.00	3.62	0.45	25.79	7.11	4.96	19.50
680.00	3.61	0.44	25.80	7.22	5.07	19.65
700.00	3.60	0.43	25.96	7.26	5.11	19.86
720.00	3.59	0.42	26.58	7.06	4.91	20.31
740.00	3.59	0.41	27.03	6.95	4.79	20.66
760.00	3.58	0.39	26.83	7.15	5.00	20.68
780.00	3.57	0.38	26.59	7.38	5.23	20.68
800.00	3.56	0.38	26.65	7.45	5.30	20.83
820.00	3.56	0.37	26.90	7.42	5.27	21.08
840.00	3.55	0.36	27.29	7.32	5.17	21.38
860.00	3.55	0.35	28.05	7.04	4.89	21.87
880.00	3.54	0.34	28.42	6.95	4.80	22.16
900.00	3.53	0.33	28.20	7.15	5.00	22.16
920.00	3.53	0.33	27.87	7.40	5.25	22.09
940.00	3.52	0.32	27.68	7.58	5.43	22.10
960.00	3.52	0.31	27.80	7.61	5.46	22.26
980.00	3.51	0.31	28.10	7.54	5.39	22.50
1000.00	3.51	0.30	28.55	7.40	5.25	22.82
1050.00	3.50	0.29	29.95	6.90	4.75	23.75
1100.00	3.49	0.27	30.11	7.01	4.86	24.04
1150.00	3.48	0.26	29.39	7.55	5.40	23.88
1200.00	3.47	0.25	29.75	7.55	5.39	24.26
1250.00	3.47	0.24	30.50	7.34	5.19	24.82
1300.00	3.46	0.23	30.97	7.26	5.11	25.23
1350.00	3.45	0.22	30.52	7.65	5.49	25.18
1400.00	3.45	0.21	30.44	7.84	5.69	25.31
1450.00	3.44	0.21	31.19	7.61	5.46	25.84
1500.00	3.44	0.20	32.17	7.26	5.11	26.48
1550.00	3.43	0.19	32.92	7.02	4.87	27.01
1600.00	3.43	0.19	32.90	7.17	5.01	27.14
1650.00	3.42	0.18	32.71	7.39	5.24	27.18
1700.00	3.42	0.18	32.66	7.54	5.38	27.29
1750.00	3.42	0.17	33.02	7.48	5.33	27.60

Frequency	Distance	Wavelength	Attenuation	Gain (Isotr.)	Gain (Dipole)	Ant.-Factor
MHz	m	m	dB	dBi	dBd	dB/m
1800.00	3.41	0.17	33.76	7.22	5.07	28.10
1850.00	3.41	0.16	34.55	6.94	4.79	28.62
1900.00	3.41	0.16	34.45	7.11	4.96	28.69
1950.00	3.40	0.15	33.93	7.47	5.32	28.55
2000.00	3.40	0.15	33.78	7.66	5.51	28.58
2050.00	3.40	0.15	34.04	7.63	5.48	28.82
2100.00	3.40	0.14	34.90	7.30	5.15	29.36
2150.00	3.39	0.14	35.75	6.98	4.83	29.89
2200.00	3.39	0.14	36.78	6.56	4.41	30.51
2250.00	3.39	0.13	37.38	6.36	4.21	30.91
2300.00	3.39	0.13	37.71	6.28	4.13	31.17
2350.00	3.39	0.13	38.07	6.19	4.04	31.45
2400.00	3.38	0.13	38.59	6.02	3.87	31.80
2450.00	3.38	0.12	39.26	5.78	3.62	32.23
2500.00	3.38	0.12	39.70	5.64	3.49	32.54
2550.00	3.38	0.12	40.02	5.56	3.41	32.79
2600.00	3.38	0.12	40.48	5.42	3.27	33.10
2650.00	3.38	0.11	40.88	5.30	3.14	33.39
2700.00	3.37	0.11	40.80	5.42	3.27	33.43
2750.00	3.37	0.11	40.56	5.61	3.46	33.39
2800.00	3.37	0.11	40.21	5.87	3.72	33.30
2850.00	3.37	0.11	40.08	6.01	3.85	33.31
2900.00	3.37	0.10	40.05	6.09	3.94	33.37
2950.00	3.37	0.10	40.15	6.12	3.97	33.50
3000.00	3.37	0.10	40.59	5.97	3.82	33.80
3050.00	3.36	0.10	41.13	5.77	3.61	34.14
3100.00	3.36	0.10	42.24	5.28	3.13	34.77
3150.00	3.36	0.10	42.87	5.03	2.88	35.15
3200.00	3.36	0.09	43.45	4.81	2.66	35.51
3250.00	3.36	0.09	43.94	4.63	2.48	35.83
3300.00	3.36	0.09	44.05	4.64	2.49	35.95
3350.00	3.36	0.09	44.04	4.71	2.56	36.01
3400.00	3.36	0.09	44.01	4.79	2.64	36.06
3450.00	3.36	0.09	44.02	4.85	2.69	36.13
3500.00	3.36	0.09	44.08	4.88	2.73	36.22
3550.00	3.35	0.08	44.18	4.89	2.74	36.34
3600.00	3.35	0.08	44.35	4.86	2.71	36.48
3650.00	3.35	0.08	44.40	4.90	2.75	36.57
3700.00	3.35	0.08	44.47	4.92	2.77	36.67
3750.00	3.35	0.08	44.79	4.82	2.67	36.88
3800.00	3.35	0.08	44.72	4.91	2.76	36.91
3850.00	3.35	0.08	44.58	5.03	2.88	36.90
3900.00	3.35	0.08	44.31	5.23	3.08	36.81
3950.00	3.35	0.08	44.14	5.37	3.21	36.79
4000.00	3.35	0.08	43.82	5.58	3.43	36.68



Daten für Emissionsmessungen (Bezugspunkt: Mitte)  
*Data for Emission Measurements (Reference Point: Center)*

Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Center	k (10m) Center	gi (3m) Center	k (3m) Center
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m
20.0	-33.28	29.53	-33.66	29.90	-34.49	30.73
22.0	-30.28	27.34	-30.66	27.73	-31.49	28.56
24.0	-27.50	25.32	-27.88	25.71	-28.71	26.54
26.0	-25.78	24.30	-26.16	24.68	-26.99	25.51
28.0	-24.17	23.34	-24.55	23.72	-25.38	24.55
30.0	-23.11	22.87	-23.49	23.25	-24.32	24.09
32.0	-21.52	21.85	-21.90	22.23	-22.73	23.06
34.0	-19.24	20.09	-19.62	20.47	-20.45	21.30
36.0	-17.57	18.92	-17.95	19.30	-18.78	20.13
38.0	-15.45	17.26	-15.83	17.65	-16.66	18.48
40.0	-13.53	15.79	-13.91	16.17	-14.74	17.01
42.0	-11.51	14.19	-11.89	14.58	-12.72	15.41
44.0	-8.99	12.08	-9.37	12.46	-10.20	13.29
46.0	-7.01	10.49	-7.39	10.87	-8.22	11.70
48.0	-5.01	8.86	-5.39	9.24	-6.22	10.07
50.0	-2.90	7.09	-3.28	7.48	-4.11	8.31
55.0	1.05	3.98	0.67	4.36	-0.16	5.19
60.0	1.24	4.55	0.86	4.93	0.03	5.76
65.0	0.08	6.40	-0.30	6.78	-1.13	7.61
70.0	-0.19	7.31	-0.57	7.69	-1.40	8.53
75.0	0.41	7.32	0.03	7.69	-0.80	8.53
80.0	0.60	7.68	0.22	8.06	-0.61	8.90
85.0	0.92	7.89	0.54	8.27	-0.29	9.10
90.0	1.18	8.13	0.80	8.51	-0.03	9.34
95.0	1.44	8.34	1.06	8.72	0.23	9.55
100.0	1.86	8.36	1.48	8.74	0.65	9.57
105.0	2.03	8.61	1.65	9.00	0.82	9.83
110.0	2.02	9.02	1.64	9.41	0.81	10.24
115.0	2.12	9.32	1.74	9.70	0.91	10.53
120.0	2.48	9.32	2.10	9.71	1.27	10.54
125.0	3.14	9.02	2.79	9.37	2.01	10.14
130.0	3.78	8.72	3.46	9.04	2.74	9.75
135.0	4.26	8.57	3.96	8.87	3.30	9.53
140.0	5.01	8.13	4.74	8.41	4.13	9.01
145.0	5.66	7.78	5.41	8.04	4.85	8.60
150.0	6.07	7.68	5.84	7.90	5.32	8.42
155.0	6.27	7.76	6.06	7.97	5.59	8.44
160.0	6.30	8.00	6.11	8.20	5.67	8.63
165.0	6.37	8.20	6.19	8.38	5.80	8.77
170.0	6.48	8.35	6.32	8.51	5.96	8.87
175.0	6.29	8.79	6.15	8.93	5.82	9.26
180.0	5.73	9.60	5.60	9.72	5.31	10.02
185.0	5.02	10.55	4.90	10.66	4.64	10.93
190.0	5.40	10.39	5.30	10.49	5.07	10.72
195.0	6.29	9.73	6.20	9.82	5.99	10.03
200.0	6.51	9.73	6.43	9.81	6.25	9.99
210.0	6.15	10.51	6.09	10.57	5.96	10.70
220.0	5.87	11.20	5.84	11.23	5.75	11.31
230.0	5.44	12.01	5.42	12.03	5.38	12.07



Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Center	k (10m) Center	gi (3m) Center	k (3m) Center
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m
240.0	5.16	12.67	5.16	12.66	5.16	12.66
250.0	5.05	13.13	5.07	13.11	5.11	13.07
260.0	5.72	12.80	5.75	12.77	5.82	12.70
270.0	6.21	12.64	6.25	12.59	6.36	12.49
280.0	6.26	12.90	6.32	12.85	6.45	12.71
290.0	6.33	13.14	6.40	13.07	6.56	12.90
300.0	6.51	13.25	6.59	13.17	6.77	12.99
320.0	6.59	13.73	6.69	13.63	6.93	13.39
340.0	6.59	14.26	6.71	14.14	6.99	13.86
360.0	6.74	14.60	6.87	14.47	7.19	14.16
380.0	6.67	15.15	6.82	15.00	7.18	14.64
400.0	6.62	15.64	6.78	15.48	7.16	15.10
420.0	6.72	15.97	6.89	15.79	7.30	15.38
440.0	7.06	16.03	7.24	15.85	7.67	15.41
460.0	7.27	16.21	7.46	16.01	7.93	15.54
480.0	7.18	16.66	7.38	16.46	7.87	15.97
500.0	7.18	17.02	7.39	16.81	7.89	16.31
520.0	7.08	17.46	7.30	17.24	7.82	16.72
540.0	7.05	17.82	7.27	17.59	7.82	17.05
560.0	7.03	18.16	7.26	17.92	7.82	17.37
580.0	6.91	18.58	7.14	18.35	7.71	17.78
600.0	6.93	18.85	7.17	18.61	7.77	18.02
620.0	7.10	18.96	7.35	18.72	7.95	18.12
640.0	7.17	19.17	7.42	18.92	8.04	18.31
660.0	7.11	19.50	7.37	19.25	7.99	18.62
680.0	7.22	19.65	7.48	19.39	8.12	18.75
700.0	7.26	19.86	7.52	19.60	8.18	18.95
720.0	7.06	20.31	7.33	20.04	7.99	19.38
740.0	6.95	20.66	7.22	20.39	7.88	19.72
760.0	7.15	20.68	7.42	20.41	8.10	19.74
780.0	7.38	20.68	7.66	20.40	8.34	19.72
800.0	7.45	20.83	7.73	20.55	8.43	19.85
820.0	7.42	21.08	7.70	20.79	8.40	20.10
840.0	7.32	21.38	7.61	21.10	8.32	20.39
860.0	7.04	21.87	7.33	21.58	8.04	20.87
880.0	6.95	22.16	7.24	21.87	7.96	21.15
900.0	7.15	22.16	7.45	21.86	8.18	21.13
920.0	7.40	22.09	7.70	21.80	8.43	21.07
940.0	7.58	22.10	7.88	21.80	8.62	21.06
960.0	7.61	22.26	7.91	21.95	8.65	21.21
980.0	7.54	22.50	7.84	22.20	8.60	21.44
1000.0	7.40	22.82	7.70	22.52	8.46	21.76
1050.0	6.90	23.75	7.21	23.43	7.98	22.67
1100.0	7.01	24.04	7.32	23.72	8.10	22.94
1150.0	7.55	23.88	7.87	23.57	8.66	22.77
1200.0	7.55	24.26	7.87	23.93	8.68	23.13
1250.0	7.34	24.82	7.66	24.50	8.47	23.69
1300.0	7.26	25.23	7.59	24.91	8.40	24.10
1350.0	7.65	25.18	7.98	24.84	8.81	24.02
1400.0	7.84	25.31	8.17	24.97	9.00	24.14
1450.0	7.61	25.84	7.95	25.50	8.79	24.66
1500.0	7.26	26.48	7.60	26.15	8.44	25.31
1550.0	7.02	27.01	7.36	26.67	8.21	25.81

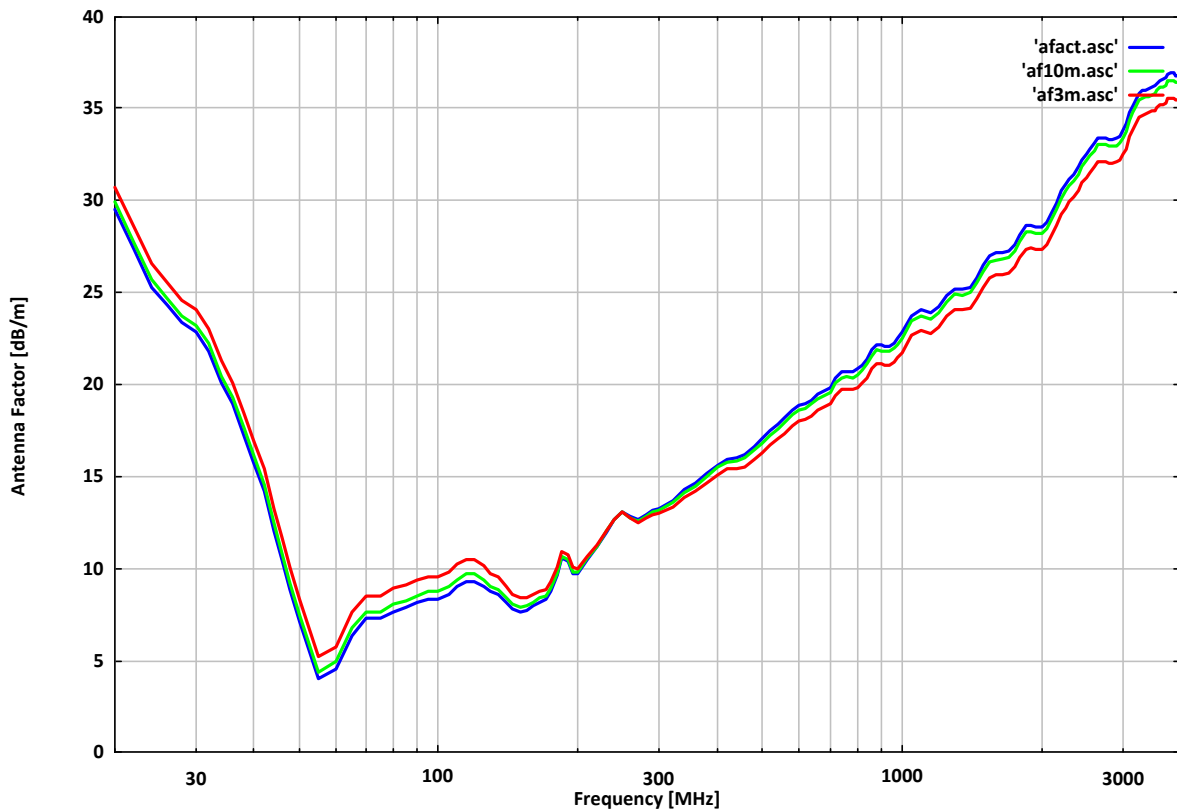
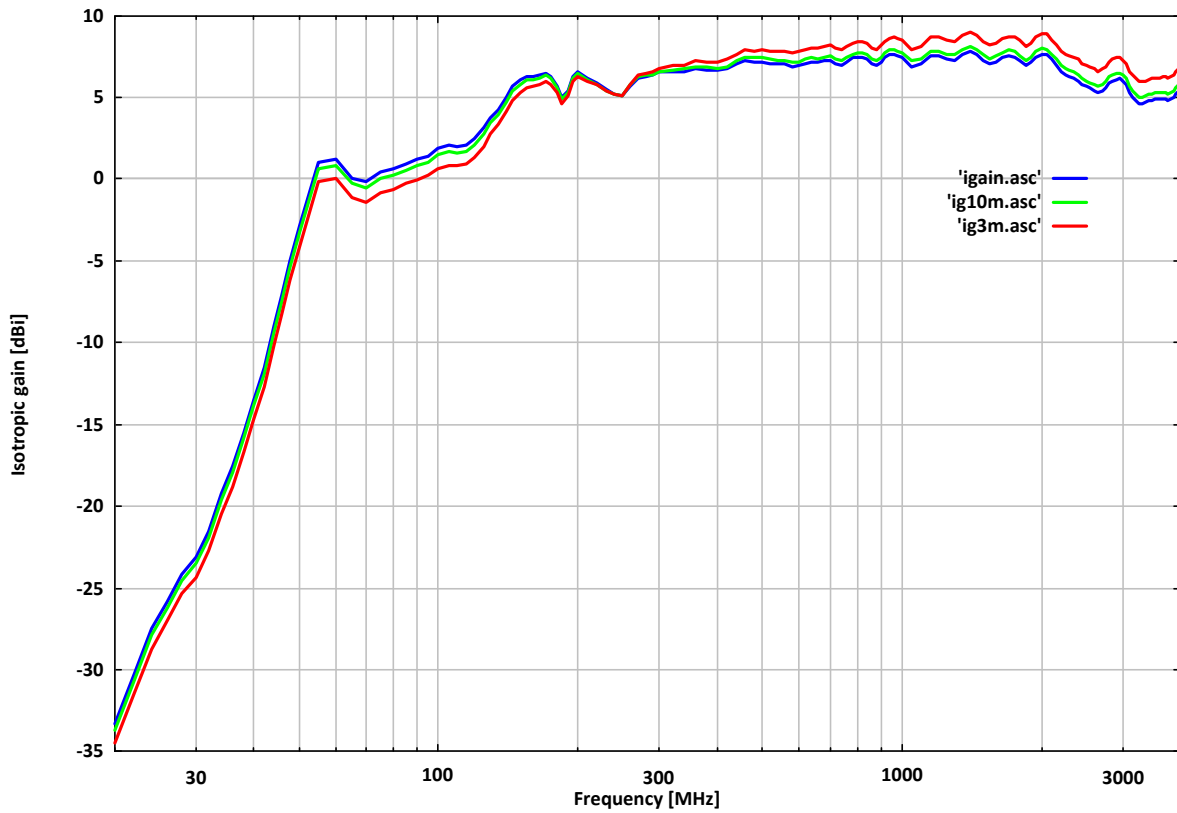


Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Center	k (10m) Center	gi (3m) Center	k (3m) Center
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m
1600.0	7.17	27.14	7.51	26.79	8.36	25.94
1650.0	7.39	27.18	7.74	26.83	8.60	25.97
1700.0	7.54	27.29	7.89	26.94	8.75	26.08
1750.0	7.48	27.60	7.83	27.26	8.69	26.39
1800.0	7.22	28.10	7.57	27.76	8.45	26.88
1850.0	6.94	28.62	7.29	28.27	8.17	27.40
1900.0	7.11	28.69	7.46	28.34	8.34	27.46
1950.0	7.47	28.55	7.82	28.20	8.71	27.31
2000.0	7.66	28.58	8.01	28.23	8.90	27.34
2050.0	7.63	28.82	7.98	28.47	8.87	27.58
2100.0	7.30	29.36	7.65	29.01	8.54	28.12
2150.0	6.98	29.89	7.34	29.53	8.24	28.63
2200.0	6.56	30.51	6.92	30.15	7.82	29.25
2250.0	6.36	30.91	6.72	30.54	7.62	29.64
2300.0	6.28	31.17	6.64	30.82	7.54	29.91
2350.0	6.19	31.45	6.55	31.09	7.45	30.19
2400.0	6.02	31.80	6.38	31.44	7.30	30.53
2450.0	5.78	32.23	6.14	31.86	7.06	30.95
2500.0	5.64	32.54	6.00	32.18	6.92	31.26
2550.0	5.56	32.79	5.92	32.43	6.84	31.51
2600.0	5.42	33.10	5.78	32.74	6.70	31.82
2650.0	5.30	33.39	5.66	33.02	6.58	32.11
2700.0	5.42	33.43	5.79	33.06	6.71	32.13
2750.0	5.61	33.39	5.98	33.03	6.90	32.10
2800.0	5.87	33.30	6.24	32.93	7.16	32.00
2850.0	6.01	33.31	6.38	32.94	7.30	32.01
2900.0	6.09	33.37	6.46	33.01	7.38	32.08
2950.0	6.12	33.50	6.49	33.13	7.41	32.20
3000.0	5.97	33.80	6.34	33.42	7.26	32.50
3050.0	5.77	34.14	6.14	33.76	7.08	32.83
3100.0	5.28	34.77	5.65	34.39	6.59	33.46
3150.0	5.03	35.15	5.40	34.78	6.34	33.85
3200.0	4.81	35.51	5.18	35.14	6.12	34.20
3250.0	4.63	35.83	5.00	35.45	5.94	34.52
3300.0	4.64	35.95	5.01	35.58	5.95	34.64
3350.0	4.71	36.01	5.08	35.64	6.02	34.70
3400.0	4.79	36.06	5.16	35.69	6.10	34.75
3450.0	4.85	36.13	5.22	35.75	6.16	34.82
3500.0	4.88	36.22	5.25	35.85	6.19	34.91
3550.0	4.89	36.34	5.27	35.96	6.22	35.01
3600.0	4.86	36.48	5.24	36.11	6.19	35.16
3650.0	4.90	36.57	5.28	36.19	6.23	35.24
3700.0	4.92	36.67	5.30	36.29	6.25	35.34
3750.0	4.82	36.88	5.20	36.50	6.15	35.55
3800.0	4.91	36.91	5.29	36.53	6.24	35.58
3850.0	5.03	36.90	5.41	36.52	6.36	35.57
3900.0	5.23	36.81	5.61	36.43	6.56	35.48
3950.0	5.37	36.79	5.75	36.40	6.70	35.46
4000.0	5.58	36.68	5.96	36.30	6.91	35.35





Daten für Emissionsmessungen (Bezugspunkt: Mitte)  
Data for Emission Measurements (Reference Point: Center)



Daten für Immunitätsprüfungen (Bezugspunkt: Spitze)  
 Data for Immunity Tests (Reference Point: Tip)

Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Tip	k (10m) Tip	gi (3m) Tip	k (3m) Tip	gi (1m) Tip	k (1m) Tip
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m	dBi	dB/m
20.0	-33.28	29.53	-34.03	30.27	-35.57	31.81	-38.88	35.12
22.0	-30.28	27.34	-31.03	28.10	-32.57	29.64	-35.88	32.95
24.0	-27.50	25.32	-28.25	26.08	-29.79	27.61	-33.10	30.92
26.0	-25.78	24.30	-26.53	25.05	-28.07	26.59	-31.38	29.90
28.0	-24.17	23.34	-24.92	24.09	-26.46	25.62	-29.77	28.93
30.0	-23.11	22.87	-23.86	23.62	-25.40	25.16	-28.71	28.47
32.0	-21.52	21.85	-22.27	22.60	-23.81	24.13	-27.12	27.44
34.0	-19.24	20.09	-19.99	20.84	-21.53	22.38	-24.84	25.69
36.0	-17.57	18.92	-18.32	19.67	-19.86	21.21	-23.17	24.51
38.0	-15.45	17.26	-16.20	18.02	-17.74	19.56	-21.05	22.86
40.0	-13.53	15.79	-14.28	16.54	-15.82	18.08	-19.13	21.39
42.0	-11.51	14.19	-12.26	14.95	-13.80	16.48	-17.11	19.79
44.0	-8.99	12.08	-9.74	12.83	-11.28	14.37	-14.59	17.68
46.0	-7.01	10.49	-7.76	11.24	-9.30	12.78	-12.61	16.08
48.0	-5.01	8.86	-5.76	9.61	-7.30	11.14	-10.61	14.45
50.0	-2.90	7.09	-3.65	7.85	-5.19	9.39	-8.50	12.70
55.0	1.05	3.98	0.30	4.73	-1.24	6.27	-4.55	9.58
60.0	1.24	4.55	0.49	5.30	-1.05	6.83	-4.36	10.14
65.0	0.08	6.40	-0.67	7.15	-2.21	8.69	-5.52	12.00
70.0	-0.19	7.31	-0.94	8.06	-2.48	9.60	-5.79	12.91
75.0	0.41	7.32	-0.34	8.06	-1.88	9.60	-5.19	12.91
80.0	0.60	7.68	-0.15	8.43	-1.69	9.97	-5.00	13.28
85.0	0.92	7.89	0.17	8.64	-1.37	10.18	-4.68	13.49
90.0	1.18	8.13	0.43	8.88	-1.11	10.41	-4.42	13.72
95.0	1.44	8.34	0.69	9.09	-0.85	10.62	-4.16	13.93
100.0	1.86	8.36	1.11	9.11	-0.43	10.65	-3.74	13.96
105.0	2.03	8.61	1.28	9.37	-0.26	10.90	-3.57	14.21
110.0	2.02	9.02	1.27	9.78	-0.27	11.32	-3.58	14.63
115.0	2.12	9.32	1.37	10.07	-0.17	11.60	-3.48	14.91
120.0	2.48	9.32	1.73	10.08	0.19	11.61	-3.12	14.92
125.0	3.14	9.02	2.42	9.74	0.93	11.23	-2.30	14.46
130.0	3.78	8.72	3.08	9.42	1.65	10.85	-1.49	13.99
135.0	4.26	8.57	3.59	9.24	2.20	10.63	-0.87	13.70
140.0	5.01	8.13	4.36	8.78	3.01	10.13	0.03	13.12
145.0	5.66	7.78	5.03	8.42	3.72	9.73	0.80	12.65
150.0	6.07	7.68	5.46	8.28	4.19	9.55	1.33	12.41
155.0	6.27	7.76	5.68	8.34	4.45	9.58	1.66	12.37
160.0	6.30	8.00	5.73	8.57	4.53	9.78	1.79	12.51
165.0	6.37	8.20	5.81	8.75	4.64	9.93	1.97	12.60
170.0	6.48	8.35	5.94	8.89	4.80	10.03	2.18	12.65
175.0	6.29	8.79	5.77	9.31	4.66	10.42	2.10	12.98
180.0	5.73	9.60	5.22	10.11	4.13	11.19	1.62	13.70
185.0	5.02	10.55	4.52	11.04	3.46	12.10	0.99	14.57
190.0	5.40	10.39	4.92	10.88	3.89	11.91	1.48	14.31
195.0	6.29	9.73	5.82	10.20	4.80	11.22	2.43	13.59
200.0	6.51	9.73	6.05	10.19	5.06	11.18	2.73	13.51
210.0	6.15	10.51	5.71	10.95	4.76	11.90	2.51	14.15
220.0	5.87	11.20	5.45	11.62	4.54	12.52	2.38	14.69
230.0	5.44	12.01	5.04	12.42	4.16	13.29	2.06	15.39



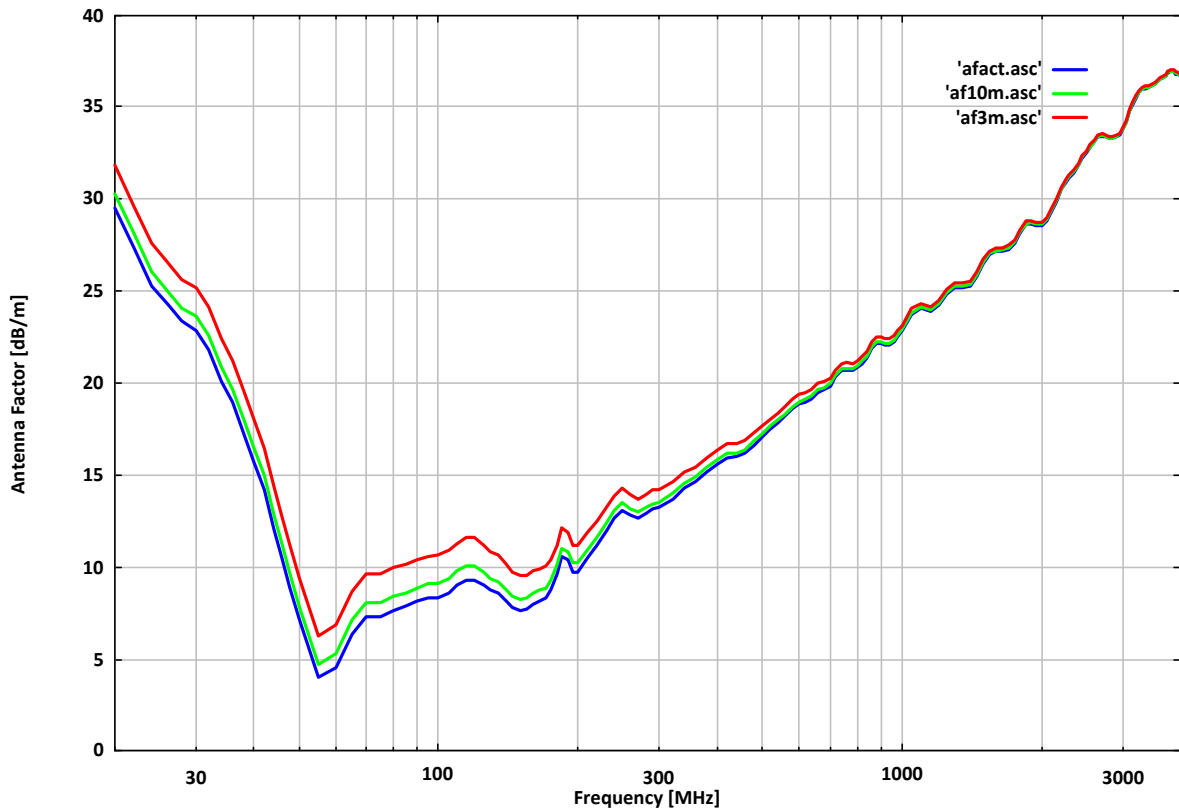
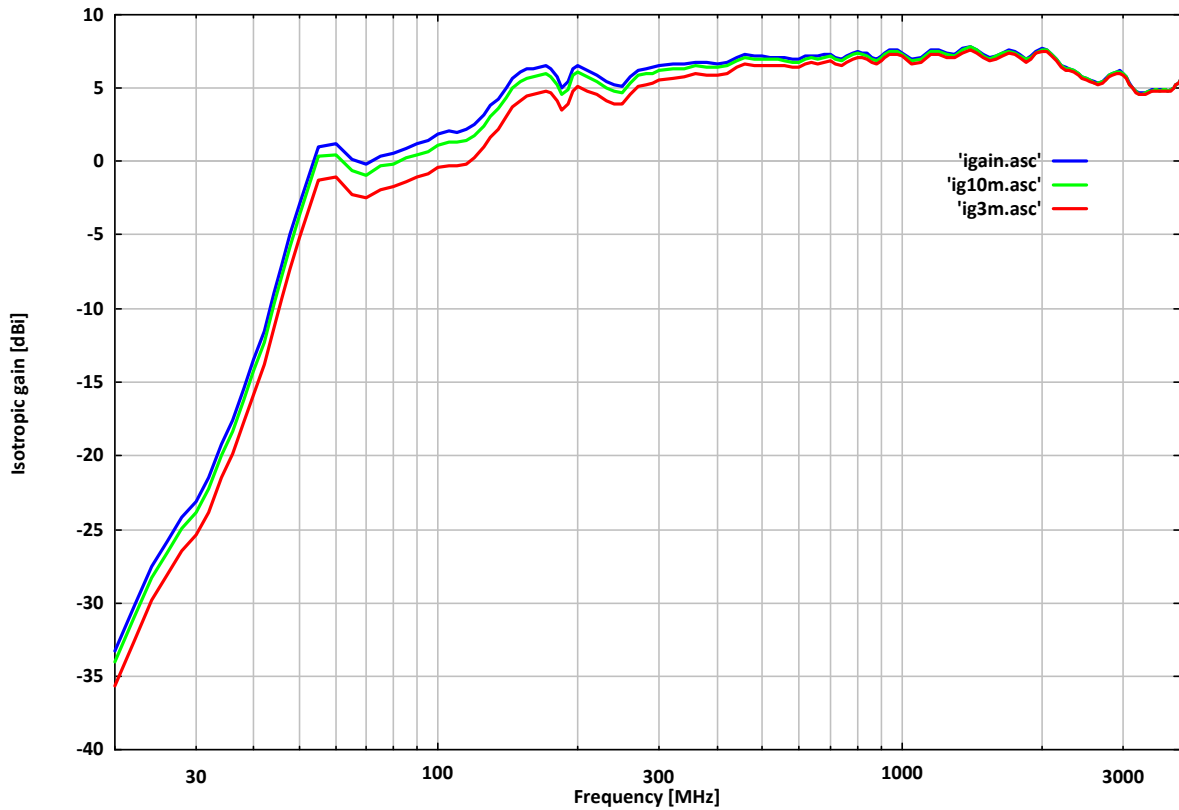
Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Tip	k (10m) Tip	gi (3m) Tip	k (3m) Tip	gi (1m) Tip	k (1m) Tip
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m	dBi	dB/m
240.0	5.16	12.67	4.77	13.05	3.93	13.89	1.90	15.92
250.0	5.05	13.13	4.68	13.50	3.87	14.30	1.91	16.27
260.0	5.72	12.80	5.36	13.16	4.58	13.94	2.67	15.85
270.0	6.21	12.64	5.87	12.98	5.11	13.74	3.26	15.59
280.0	6.26	12.90	5.93	13.24	5.20	13.96	3.40	15.76
290.0	6.33	13.14	6.01	13.46	5.31	14.16	3.56	15.90
300.0	6.51	13.25	6.20	13.56	5.51	14.25	3.81	15.96
320.0	6.59	13.73	6.30	14.02	5.66	14.67	4.05	16.28
340.0	6.59	14.26	6.32	14.53	5.71	15.14	4.18	16.67
360.0	6.74	14.60	6.48	14.87	5.90	15.45	4.43	16.92
380.0	6.67	15.15	6.43	15.39	5.88	15.93	4.49	17.32
400.0	6.62	15.64	6.38	15.88	5.86	16.40	4.51	17.75
420.0	6.72	15.97	6.50	16.19	6.00	16.69	4.71	17.97
440.0	7.06	16.03	6.85	16.24	6.36	16.72	5.12	17.97
460.0	7.27	16.21	7.07	16.41	6.61	16.86	5.44	18.04
480.0	7.18	16.66	6.99	16.86	6.55	17.29	5.42	18.43
500.0	7.18	17.02	6.99	17.21	6.57	17.63	5.45	18.75
520.0	7.08	17.46	6.90	17.64	6.49	18.05	5.42	19.12
540.0	7.05	17.82	6.88	17.99	6.49	18.38	5.47	19.40
560.0	7.03	18.16	6.86	18.32	6.48	18.70	5.48	19.70
580.0	6.91	18.58	6.75	18.74	6.38	19.11	5.40	20.09
600.0	6.93	18.85	6.78	19.01	6.42	19.36	5.49	20.29
620.0	7.10	18.96	6.95	19.12	6.61	19.46	5.70	20.37
640.0	7.17	19.17	7.02	19.32	6.69	19.65	5.81	20.54
660.0	7.11	19.50	6.97	19.64	6.64	19.97	5.78	20.83
680.0	7.22	19.65	7.08	19.79	6.77	20.10	5.93	20.94
700.0	7.26	19.86	7.13	20.00	6.82	20.30	6.01	21.11
720.0	7.06	20.31	6.93	20.44	6.64	20.73	5.85	21.52
740.0	6.95	20.66	6.82	20.78	6.53	21.08	5.74	21.87
760.0	7.15	20.68	7.02	20.81	6.74	21.10	5.97	21.86
780.0	7.38	20.68	7.26	20.80	6.98	21.08	6.24	21.82
800.0	7.45	20.83	7.33	20.95	7.07	21.21	6.35	21.93
820.0	7.42	21.08	7.30	21.19	7.04	21.46	6.32	22.18
840.0	7.32	21.38	7.21	21.50	6.95	21.75	6.26	22.45
860.0	7.04	21.87	6.93	21.98	6.67	22.24	5.98	22.93
880.0	6.95	22.16	6.84	22.27	6.60	22.51	5.93	23.18
900.0	7.15	22.16	7.05	22.26	6.81	22.50	6.17	23.14
920.0	7.40	22.09	7.30	22.20	7.06	22.44	6.42	23.08
940.0	7.58	22.10	7.48	22.20	7.25	22.43	6.63	23.05
960.0	7.61	22.26	7.51	22.35	7.28	22.58	6.66	23.20
980.0	7.54	22.50	7.44	22.60	7.23	22.82	6.63	23.41
1000.0	7.40	22.82	7.30	22.92	7.09	23.13	6.49	23.73
1050.0	6.90	23.75	6.81	23.83	6.60	24.04	6.03	24.61
1100.0	7.01	24.04	6.92	24.12	6.73	24.32	6.18	24.87
1150.0	7.55	23.88	7.47	23.97	7.28	24.15	6.76	24.67
1200.0	7.55	24.26	7.47	24.33	7.29	24.51	6.80	25.00
1250.0	7.34	24.82	7.26	24.90	7.08	25.07	6.59	25.57
1300.0	7.26	25.23	7.19	25.31	7.02	25.48	6.55	25.95
1350.0	7.65	25.18	7.58	25.25	7.42	25.41	6.98	25.85
1400.0	7.84	25.31	7.77	25.37	7.61	25.53	7.17	25.97
1450.0	7.61	25.84	7.55	25.90	7.40	26.05	6.98	26.47
1500.0	7.26	26.48	7.20	26.55	7.05	26.70	6.63	27.11
1550.0	7.02	27.01	6.96	27.07	6.82	27.21	6.43	27.59

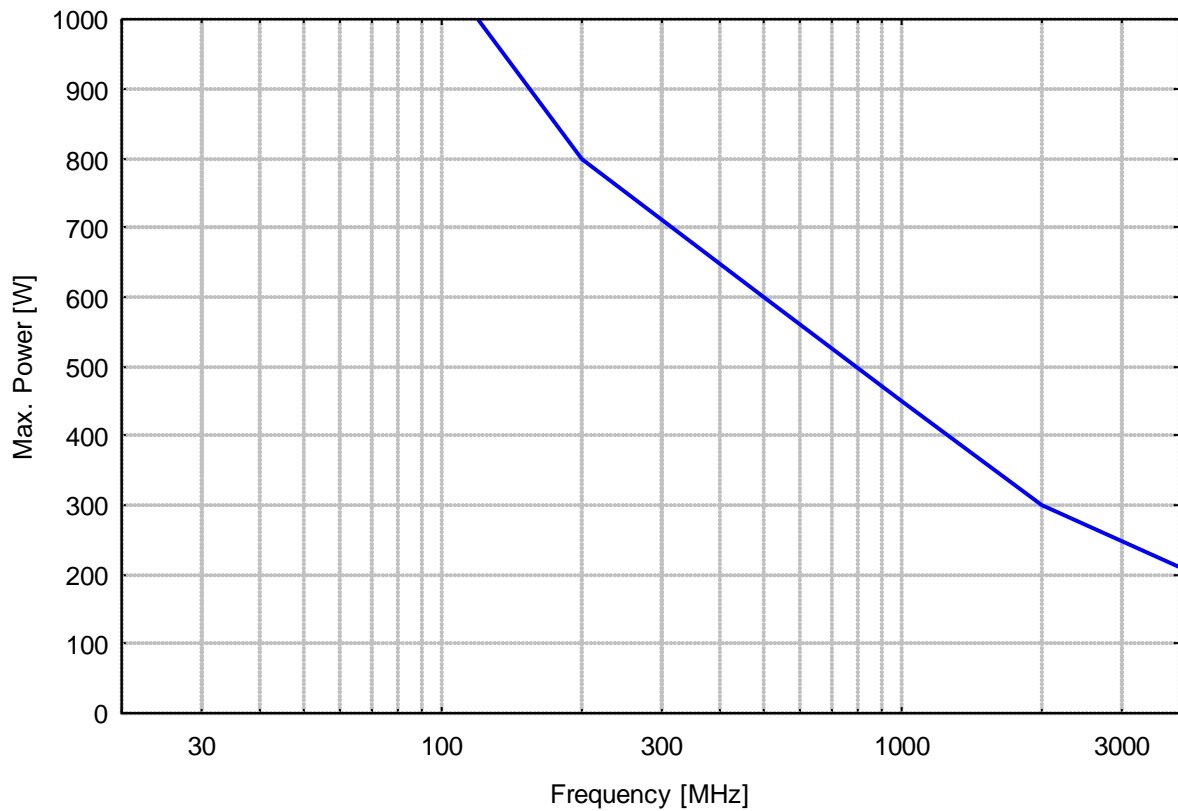
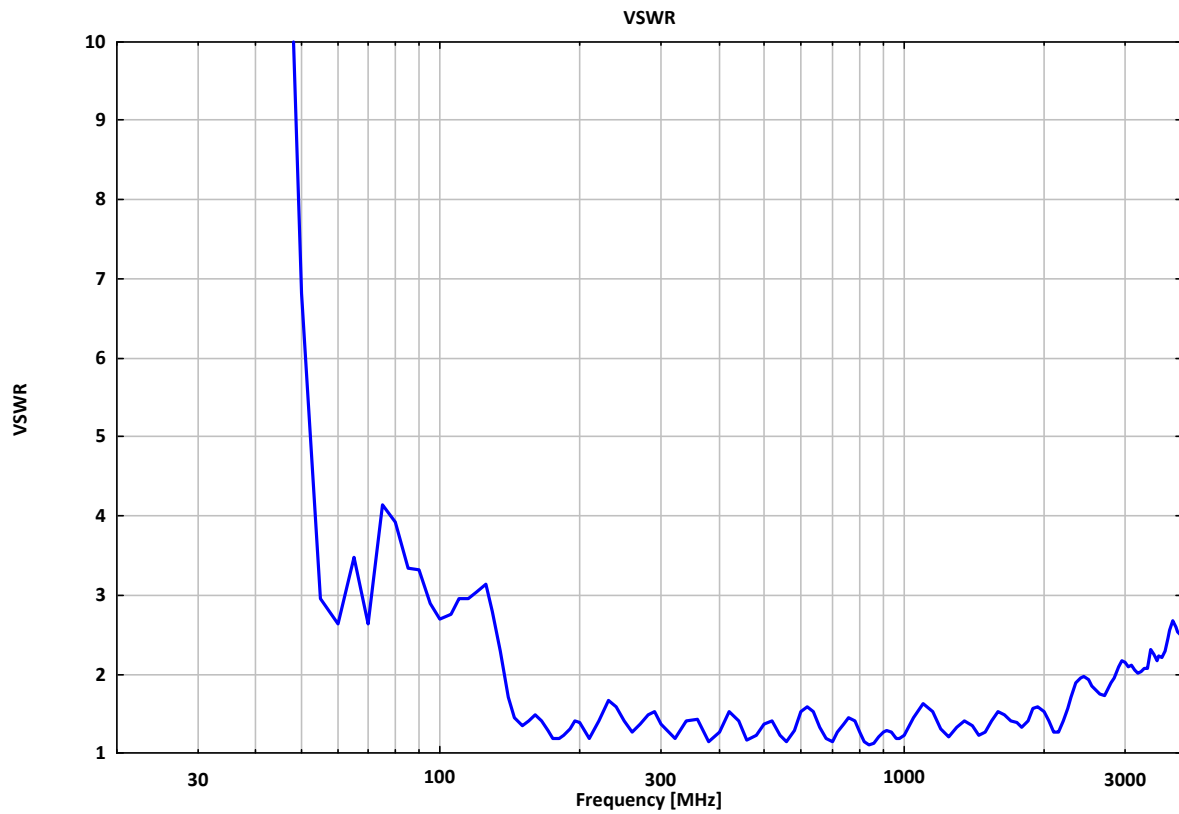


Frequency	Gain (Iso.) Farfield	Ant.-Fact k Farfield	gi (10 m) Tip	k (10m) Tip	gi (3m) Tip	k (3m) Tip	gi (1m) Tip	k (1m) Tip
MHz	dBi	dB/m	dBi	dB/m	dBi	dB/m	dBi	dB/m
1600.0	7.17	27.14	7.11	27.19	6.97	27.33	6.58	27.72
1650.0	7.39	27.18	7.33	27.24	7.20	27.37	6.84	27.73
1700.0	7.54	27.29	7.48	27.35	7.35	27.48	6.99	27.84
1750.0	7.48	27.60	7.42	27.66	7.29	27.79	6.93	28.15
1800.0	7.22	28.10	7.17	28.16	7.05	28.28	6.71	28.61
1850.0	6.94	28.62	6.89	28.68	6.77	28.80	6.43	29.13
1900.0	7.11	28.69	7.06	28.74	6.94	28.86	6.60	29.19
1950.0	7.47	28.55	7.42	28.60	7.31	28.71	7.00	29.02
2000.0	7.66	28.58	7.61	28.63	7.50	28.74	7.19	29.05
2050.0	7.63	28.82	7.58	28.87	7.47	28.98	7.16	29.29
2100.0	7.30	29.36	7.25	29.41	7.14	29.52	6.83	29.83
2150.0	6.98	29.89	6.94	29.93	6.84	30.03	6.56	30.31
2200.0	6.56	30.51	6.52	30.55	6.42	30.65	6.14	30.93
2250.0	6.36	30.91	6.32	30.95	6.22	31.05	5.94	31.33
2300.0	6.28	31.17	6.24	31.22	6.14	31.32	5.86	31.60
2350.0	6.19	31.45	6.15	31.49	6.05	31.59	5.77	31.88
2400.0	6.02	31.80	5.98	31.84	5.89	31.93	5.64	32.19
2450.0	5.78	32.23	5.74	32.26	5.65	32.35	5.40	32.61
2500.0	5.64	32.54	5.60	32.58	5.51	32.67	5.26	32.92
2550.0	5.56	32.79	5.52	32.83	5.43	32.92	5.18	33.17
2600.0	5.42	33.10	5.38	33.14	5.29	33.23	5.04	33.48
2650.0	5.30	33.39	5.26	33.42	5.17	33.51	4.92	33.77
2700.0	5.42	33.43	5.39	33.46	5.30	33.54	5.08	33.77
2750.0	5.61	33.39	5.58	33.43	5.49	33.51	5.27	33.74
2800.0	5.87	33.30	5.84	33.33	5.75	33.41	5.53	33.63
2850.0	6.01	33.31	5.98	33.34	5.89	33.42	5.67	33.65
2900.0	6.09	33.37	6.06	33.41	5.97	33.49	5.75	33.72
2950.0	6.12	33.50	6.09	33.53	6.00	33.61	5.78	33.84
3000.0	5.97	33.80	5.94	33.83	5.85	33.91	5.63	34.13
3050.0	5.77	34.14	5.74	34.17	5.67	34.24	5.47	34.43
3100.0	5.28	34.77	5.25	34.80	5.18	34.87	4.98	35.07
3150.0	5.03	35.15	5.00	35.19	4.93	35.26	4.73	35.46
3200.0	4.81	35.51	4.78	35.54	4.71	35.61	4.51	35.81
3250.0	4.63	35.83	4.60	35.86	4.53	35.93	4.33	36.13
3300.0	4.64	35.95	4.61	35.98	4.54	36.05	4.34	36.25
3350.0	4.71	36.01	4.68	36.04	4.61	36.11	4.41	36.31
3400.0	4.79	36.06	4.76	36.09	4.69	36.16	4.49	36.36
3450.0	4.85	36.13	4.82	36.16	4.75	36.23	4.55	36.43
3500.0	4.88	36.22	4.85	36.25	4.78	36.32	4.58	36.52
3550.0	4.89	36.34	4.86	36.36	4.80	36.42	4.63	36.59
3600.0	4.86	36.48	4.83	36.51	4.77	36.57	4.60	36.74
3650.0	4.90	36.57	4.87	36.59	4.81	36.65	4.64	36.82
3700.0	4.92	36.67	4.89	36.69	4.83	36.75	4.66	36.92
3750.0	4.82	36.88	4.79	36.91	4.73	36.97	4.56	37.14
3800.0	4.91	36.91	4.88	36.93	4.82	36.99	4.65	37.16
3850.0	5.03	36.90	5.00	36.93	4.94	36.99	4.77	37.16
3900.0	5.23	36.81	5.20	36.84	5.14	36.90	4.97	37.07
3950.0	5.37	36.79	5.34	36.81	5.28	36.87	5.11	37.04
4000.0	5.58	36.68	5.55	36.71	5.49	36.77	5.32	36.94



Daten für Immunitätsprüfungen (Bezugspunkt: Spitze)  
Data for Immunity Tests (Reference Point: Tip)





### Störfestigkeitsprüfungen:

Wenn Anteile von Umgebungsreflexionen vorhanden sind, kann dies zu einer frequenz- und höhenabhängigen Änderung der Feldstärke führen. Die Leistungsangaben beziehen sich auf eine 50  $\Omega$  Quellimpedanz und unmodulierte Hochfrequenz (CW). Bei 80% Amplitudenmodulation ist die 1.8-fache Spannungssteuerung erforderlich, was in einem ca. 3.24-fachen Leistungsbedarf resultiert. Zur Steigerung der Feldstärke um den Faktor 10 ist die 100-fache Verstärkerleistung erforderlich.

**Bei der Erzeugung von hohen Feldstärken müssen die relevanten Sicherheitsvorschriften und Normen beachtet werden! Missachtung dieser Vorschriften kann zu Schädigungen der Gesundheit führen!**

### Immunity Tests:

*If environmental reflections are present, this may lead to frequency and height dependent fieldstrengths. The power figures refer to a 50  $\Omega$  source and an unmodulated (cw) signal. An 80% Amplitude Modulation requires a 1.8 times higher voltage, resulting in 3.24 times higher power compared to cw. A fieldstrength increase of factor 10 requires 100 times amplifier-power.*

**The safety precautions and relevant standards must be considered while performing tests with high fieldstrength! Ignoring these standards and precautions may result in severe danger for health!**

