

# Antena FM Dipolo de meia onda - v2



 **DIGITAL**  
ANTENAS PROFISSIONAIS

(35) 3471-7200

- Antena para transmissão em FM, polarização vertical.
- Instalação na lateral da torre, ou em tubulão no topo da torre, com baixa carga ao vento.
- Fabricada em latão com conector banhado a prata.
- Pode ser utilizado diagramas de elevação com tilt elétrico e/ou preenchimento de nulo.
- Possui acabamento em tinta epoxi amarela.
- Para outras configurações não apresentadas, consultar a fábrica.

**CARACTERÍSTICAS TÉCNICAS**

Faixa de Frequência .....	76,1 a 108,1 MHz
Largura de Banda .....	500 KHz
Polarização .....	Vertical
Impedância .....	50 ohms
Ganho .....	Vide tabela
Máxima potência por elemento.....	5000 Watts (EIA 7/8") - 10000 Watts (EIA 3-1/8")
Conexão de entrada .....	Vide tabela
VSWR .....	<1.05:1
Resistência ao Vento .....	180 Km/h
Peso.....	Vide tabela
Dimensões . . . . .	Vide tabela
Área Exposta.....	Vide tabela
Carga a o Vento.....	Vide tabela
Proteção elétrica .....	Por intermédio da estrutura da antena

**Código da Antena/Modelo**

DGFMDM	Nº de elementos	Conexão de Entrada	CH
↓	↓	↓	↓
Digital Antenas FM Dipolo de Meia Onda v2	1,2,3,4,6 ou 8	15 = EIA 1-5/8" 31 = EIA 3-1/8" 41 = EIA 4-1/16"	XXX

NOTA: Para projetos dedicados com especificações diferentes das apresentados consultar a DIGITAL ANTENAS.

Tabela de arranjos e Ganho:

Características Técnicas - Elementos com entrada EIA 1-5/8"				
Nº de Elementos	Âng. ½ Pot. Vertical (graus)	Ganho (dBd)	Potencia Máxima de entrada (KW)	Conexão de entrada
1	59	2,07	5	EIA 1-5/8"
2	27	5.07	10	EIA 1-5/8"
3	17	6.84	15	EIA 3-1/8"
4	13	8.07	20	EIA 3-1/8"
6	8,5	9.84	30	EIA 3-1/8"
8	6,5	11.07	40	EIA 4-1/16"

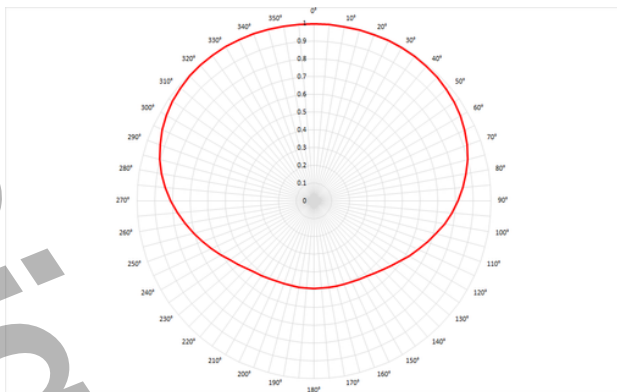
Características Técnicas - Elementos com entrada EIA 3-1/8"				
Nº de Elementos	Âng. ½ Pot. Vertical (graus)	Ganho (dBd)	Potencia Máxima de entrada (KW)	Conexão de entrada
1	59	2,07	10	EIA 3-1/8"
2	27	5.07	20	EIA 3-1/8"
3	17	6.84	30	EIA 3-1/8"
4	13	8.07	40	EIA 4-1/16"
6	8,5	9.84	40	EIA 4-1/16"
8	6,5	11.07	40	EIA 4-1/16"

### Características Mecânicas

Características Mecânicas (98,1 MHz - 1-5/8")						
N de Elementos	A	B	C	Área exposta	Carga ao Vento	Peso
1	1630	815	3000	0,12	12	8,4
2	4630	2315		0,56	56	37
3	7630	3815		0,82	82	58
4	10630	5315		1,06	106	70
6	16630	8315		1,57	157	107
8	22623	11312		2,09	209	136

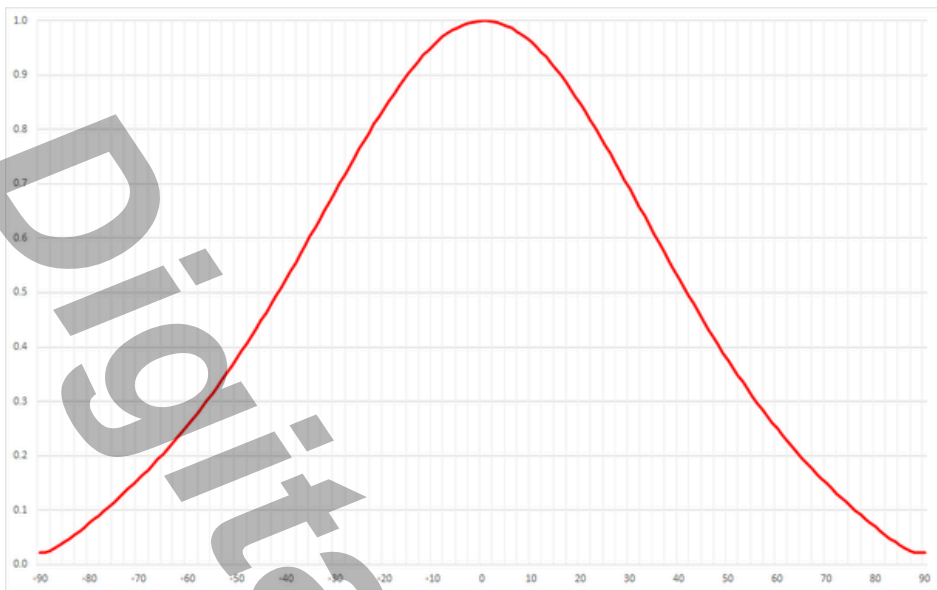
A = Altura total do sistema (mm)  
 B = Centro de fase do sistema (mm)  
 C = Largura da antena (mm)  
 Área exposta (m²)  
 Carga ao Vento (Kgf)  
 Peso (Kg)

**Diagrama de Azimute**



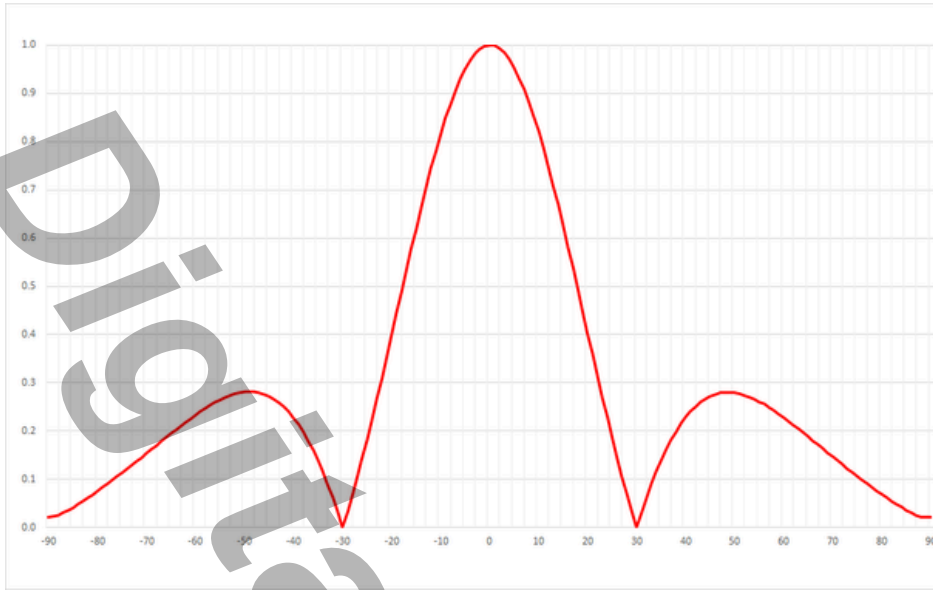
Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
1	-0.05	0.994	61	-0.42	0.953	121	-4.24	0.614	181	-6.14	0.493	241	-4.26	0.612	301	-0.31	0.965
2	-0.05	0.994	62	-0.45	0.950	122	-4.32	0.608	182	-6.14	0.493	242	-4.18	0.618	302	-0.28	0.968
3	-0.05	0.994	63	-0.48	0.946	123	-4.40	0.603	183	-6.14	0.493	243	-4.09	0.624	303	-0.26	0.971
4	-0.05	0.994	64	-0.51	0.943	124	-4.47	0.598	184	-6.14	0.493	244	-4.01	0.630	304	-0.24	0.973
5	-0.05	0.994	65	-0.54	0.940	125	-4.55	0.592	185	-6.14	0.493	245	-3.92	0.637	305	-0.21	0.976
6	-0.05	0.994	66	-0.57	0.936	126	-4.62	0.587	186	-6.14	0.493	246	-3.84	0.643	306	-0.19	0.978
7	-0.05	0.994	67	-0.61	0.932	127	-4.70	0.582	187	-6.14	0.493	247	-3.75	0.649	307	-0.18	0.979
8	-0.05	0.994	68	-0.64	0.929	128	-4.77	0.577	188	-6.14	0.493	248	-3.66	0.656	308	-0.16	0.982
9	-0.05	0.994	69	-0.68	0.925	129	-4.84	0.573	189	-6.14	0.493	249	-3.58	0.662	309	-0.14	0.984
10	-0.05	0.994	70	-0.72	0.920	130	-4.90	0.569	190	-6.13	0.494	250	-3.49	0.669	310	-0.13	0.985
11	-0.05	0.994	71	-0.76	0.916	131	-4.97	0.564	191	-6.13	0.494	251	-3.40	0.676	311	-0.11	0.987
12	-0.05	0.994	72	-0.80	0.912	132	-5.03	0.560	192	-6.13	0.494	252	-3.31	0.683	312	-0.10	0.989
13	-0.05	0.994	73	-0.84	0.908	133	-5.10	0.556	193	-6.12	0.494	253	-3.23	0.689	313	-0.09	0.990
14	-0.05	0.994	74	-0.88	0.904	134	-5.16	0.552	194	-6.12	0.494	254	-3.14	0.697	314	-0.08	0.991
15	-0.05	0.994	75	-0.93	0.898	135	-5.21	0.549	195	-6.12	0.494	255	-3.05	0.704	315	-0.07	0.992
16	-0.05	0.994	76	-0.98	0.893	136	-5.27	0.545	196	-6.11	0.495	256	-2.96	0.711	316	-0.06	0.993
17	-0.05	0.994	77	-1.02	0.889	137	-5.32	0.542	197	-6.10	0.495	257	-2.88	0.718	317	-0.05	0.994
18	-0.05	0.994	78	-1.07	0.884	138	-5.38	0.538	198	-6.10	0.495	258	-2.79	0.725	318	-0.04	0.995
19	-0.05	0.994	79	-1.12	0.879	139	-5.43	0.535	199	-6.09	0.496	259	-2.71	0.732	319	-0.03	0.997
20	-0.05	0.994	80	-1.18	0.873	140	-5.47	0.533	200	-6.08	0.497	260	-2.62	0.740	320	-0.03	0.997
21	-0.05	0.994	81	-1.23	0.868	141	-5.52	0.530	201	-6.07	0.497	261	-2.54	0.746	321	-0.02	0.998
22	-0.05	0.994	82	-1.29	0.862	142	-5.56	0.527	202	-6.06	0.498	262	-2.45	0.754	322	-0.02	0.998
23	-0.05	0.994	83	-1.34	0.857	143	-5.61	0.524	203	-6.05	0.498	263	-2.37	0.761	323	-0.01	0.999
24	-0.05	0.994	84	-1.40	0.851	144	-5.65	0.522	204	-6.03	0.499	264	-2.29	0.768	324	-0.01	0.999
25	-0.05	0.994	85	-1.46	0.845	145	-5.68	0.520	205	-6.02	0.500	265	-2.21	0.775	325	-0.01	0.999
26	-0.05	0.994	86	-1.52	0.839	146	-5.72	0.518	206	-6.00	0.501	266	-2.13	0.783	326	0.00	1.000
27	-0.05	0.994	87	-1.58	0.834	147	-5.75	0.516	207	-5.99	0.502	267	-2.06	0.789	327	0.00	1.000
28	-0.05	0.994	88	-1.65	0.827	148	-5.78	0.514	208	-5.97	0.503	268	-1.98	0.796	328	0.00	1.000
29	-0.05	0.994	89	-1.71	0.821	149	-5.81	0.512	209	-5.95	0.504	269	-1.90	0.804	329	0.00	1.000
30	-0.05	0.994	90	-1.78	0.815	150	-5.84	0.511	210	-5.92	0.506	270	-1.83	0.810	330	0.00	1.000
31	-0.05	0.994	91	-1.85	0.808	151	-5.87	0.509	211	-5.90	0.507	271	-1.76	0.817	331	0.00	1.000
32	-0.05	0.994	92	-1.92	0.802	152	-5.89	0.508	212	-5.88	0.508	272	-1.69	0.823	332	0.00	1.000
33	-0.06	0.993	93	-1.99	0.795	153	-5.91	0.506	213	-5.85	0.510	273	-1.62	0.830	333	0.00	1.000
34	-0.06	0.993	94	-2.06	0.789	154	-5.94	0.505	214	-5.82	0.512	274	-1.55	0.837	334	0.00	1.000
35	-0.06	0.993	95	-2.13	0.783	155	-5.96	0.504	215	-5.79	0.513	275	-1.48	0.843	335	0.00	1.000
36	-0.07	0.992	96	-2.21	0.775	156	-5.97	0.503	216	-5.76	0.515	276	-1.42	0.849	336	0.00	1.000
37	-0.07	0.992	97	-2.28	0.769	157	-5.99	0.502	217	-5.72	0.518	277	-1.35	0.856	337	-0.01	0.999
38	-0.08	0.991	98	-2.36	0.762	158	-6.01	0.501	218	-5.68	0.520	278	-1.29	0.862	338	-0.01	0.999
39	-0.08	0.991	99	-2.44	0.755	159	-6.02	0.500	219	-5.65	0.522	279	-1.23	0.868	339	-0.01	0.999
40	-0.09	0.990	100	-2.51	0.749	160	-6.03	0.499	220	-5.60	0.525	280	-1.17	0.874	340	-0.01	0.999
41	-0.10	0.989	101	-2.59	0.742	161	-6.05	0.498	221	-5.56	0.527	281	-1.12	0.879	341	-0.01	0.999
42	-0.11	0.987	102	-2.67	0.735	162	-6.06	0.498	222	-5.51	0.530	282	-1.06	0.885	342	-0.02	0.998
43	-0.11	0.987	103	-2.75	0.729	163	-6.07	0.497	223	-5.47	0.533	283	-1.01	0.890	343	-0.02	0.998
44	-0.12	0.986	104	-2.83	0.722	164	-6.08	0.497	224	-5.42	0.536	284	-0.95	0.896	344	-0.02	0.998
45	-0.13	0.985	105	-2.92	0.714	165	-6.08	0.497	225	-5.36	0.540	285	-0.90	0.902	345	-0.02	0.998
46	-0.14	0.984	106	-3.00	0.708	166	-6.09	0.496	226	-5.31	0.543	286	-0.86	0.906	346	-0.03	0.997
47	-0.16	0.982	107	-3.08	0.701	167	-6.10	0.495	227	-5.25	0.546	287	-0.81	0.911	347	-0.03	0.997
48	-0.17	0.981	108	-3.16	0.695	168	-6.10	0.495	228	-5.20	0.550	288	-0.76	0.916	348	-0.03	0.997
49	-0.18	0.979	109	-3.25	0.688	169	-6.11	0.495	229	-5.13	0.554	289	-0.72	0.920	349	-0.03	0.997
50	-0.20	0.977	110	-3.33	0.682	170	-6.12	0.494	230	-5.07	0.558	290	-0.68	0.925	350	-0.04	0.995
51	-0.21	0.976	111	-3.42	0.675	171	-6.12	0.494	231	-5.01	0.562	291	-0.63	0.930	351	-0.04	0.995
52	-0.23	0.974	112	-3.50	0.668	172	-6.12	0.494	232	-4.94	0.566	292	-0.59	0.934	352	-0.04	0.995
53	-0.25	0.972	113	-3.58	0.662	173	-6.13	0.494	233	-4.87	0.571	293	-0.56	0.938	353	-0.04	0.995
54	-0.26	0.971	114	-3.67	0.655	174	-6.13	0.494	234	-4.80	0.575	294	-0.52	0.942	354	-0.04	0.995
55	-0.28	0.968	115	-3.75	0.649	175	-6.13	0.494	235	-4.73	0.580	295	-0.49	0.945	355	-0.05	0.994
56	-0.30	0.966	116	-3.83	0.643	176	-6.14	0.493	236	-4.65	0.585	296	-0.45	0.950	356	-0.05	0.994
57	-0.32	0.964	117	-3.92	0.637	177	-6.14	0.493	237	-4.58	0.590	297	-0.42	0.953	357	-0.05	0.994
58	-0.35	0.961	118	-4.00	0.631	178	-6.14	0.493	238	-4.50	0.596	298	-0.39	0.956	358	-0.05	0.994
59	-0.37	0.958	119	-4.08	0.625	179	-6.14	0.493	239	-4.42	0.601	299	-0.36	0.959	359	-0.05	0.994
60	-0.4	0.955	120	-4.16	0.619	180	-6.14	0.493	240	-4.34	0.607	300	-0.33	0.963	360	0.00	1.000

Diagrama de Elevação - 1 Elemento



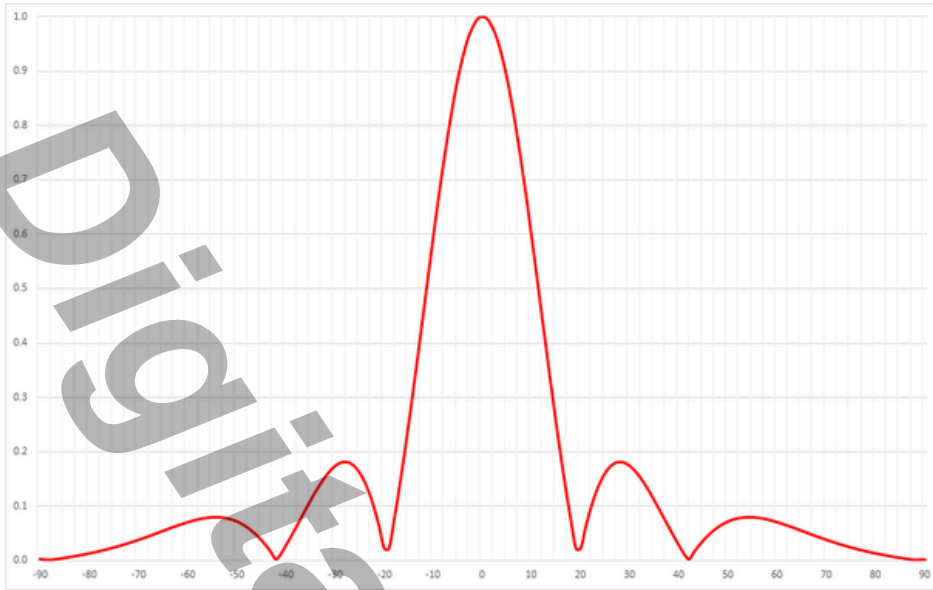
Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
-90	-33.35	0.022	-60	-11.85	0.256	-30	-3.30	0.684	0	0.00	1.000	30	-3.21	0.691	60	-12.04	0.250
-89	-32.93	0.023	-59	-11.48	0.267	-29	-3.09	0.701	1	0.00	1.000	31	-3.42	0.675	61	-12.44	0.239
-88	-31.81	0.026	-58	-11.11	0.278	-28	-2.90	0.716	2	-0.01	0.999	32	-3.64	0.658	62	-12.85	0.228
-87	-30.40	0.030	-57	-10.76	0.290	-27	-2.70	0.733	3	-0.03	0.997	33	-3.86	0.641	63	-13.26	0.217
-86	-28.97	0.036	-56	-10.41	0.302	-26	-2.52	0.748	4	-0.05	0.994	34	-4.09	0.624	64	-13.69	0.207
-85	-27.62	0.042	-55	-10.07	0.314	-25	-2.34	0.764	5	-0.08	0.991	35	-4.33	0.607	65	-14.12	0.197
-84	-26.38	0.048	-54	-9.73	0.326	-24	-2.16	0.780	6	-0.12	0.986	36	-4.57	0.591	66	-14.57	0.187
-83	-25.25	0.055	-53	-9.40	0.339	-23	-2.00	0.794	7	-0.17	0.981	37	-4.81	0.575	67	-15.04	0.177
-82	-24.22	0.062	-52	-9.08	0.352	-22	-1.83	0.810	8	-0.22	0.975	38	-5.06	0.558	68	-15.51	0.168
-81	-23.27	0.069	-51	-8.76	0.365	-21	-1.68	0.824	9	-0.28	0.968	39	-5.32	0.542	69	-16.01	0.158
-80	-22.40	0.076	-50	-8.45	0.378	-20	-1.53	0.838	10	-0.35	0.961	40	-5.58	0.526	70	-16.52	0.149
-79	-21.60	0.083	-49	-8.14	0.392	-19	-1.39	0.852	11	-0.43	0.952	41	-5.85	0.510	71	-17.05	0.140
-78	-20.84	0.091	-48	-7.84	0.406	-18	-1.25	0.866	12	-0.51	0.943	42	-6.12	0.494	72	-17.60	0.132
-77	-20.14	0.098	-47	-7.54	0.420	-17	-1.12	0.879	13	-0.60	0.933	43	-6.40	0.479	73	-18.18	0.123
-76	-19.48	0.106	-46	-7.25	0.434	-16	-1.00	0.891	14	-0.70	0.923	44	-6.68	0.463	74	-18.78	0.115
-75	-18.85	0.114	-45	-6.97	0.448	-15	-0.88	0.904	15	-0.81	0.911	45	-6.97	0.448	75	-19.42	0.107
-74	-18.25	0.122	-44	-6.69	0.463	-14	-0.77	0.915	16	-0.92	0.899	46	-7.27	0.433	76	-20.09	0.099
-73	-17.68	0.131	-43	-6.41	0.478	-13	-0.67	0.926	17	-1.04	0.887	47	-7.57	0.418	77	-20.80	0.091
-72	-17.14	0.139	-42	-6.14	0.493	-12	-0.57	0.936	18	-1.17	0.874	48	-7.87	0.404	78	-21.56	0.084
-71	-16.61	0.148	-41	-5.88	0.508	-11	-0.48	0.946	19	-1.30	0.861	49	-8.19	0.389	79	-22.37	0.076
-70	-16.11	0.156	-40	-5.62	0.524	-10	-0.40	0.955	20	-1.44	0.847	50	-8.50	0.376	80	-23.24	0.069
-69	-15.63	0.165	-39	-5.36	0.540	-9	-0.33	0.963	21	-1.59	0.833	51	-8.83	0.362	81	-24.19	0.062
-68	-15.16	0.175	-38	-5.11	0.555	-8	-0.26	0.971	22	-1.75	0.818	52	-9.16	0.348	82	-25.22	0.055
-67	-14.70	0.184	-37	-4.87	0.571	-7	-0.20	0.977	23	-1.91	0.803	53	-9.49	0.335	83	-26.35	0.048
-66	-14.26	0.194	-36	-4.63	0.587	-6	-0.15	0.983	24	-2.08	0.787	54	-9.84	0.322	84	-27.59	0.042
-65	-13.83	0.203	-35	-4.39	0.603	-5	-0.11	0.987	25	-2.25	0.772	55	-10.19	0.309	85	-28.94	0.036
-64	-13.42	0.213	-34	-4.16	0.619	-4	-0.07	0.992	26	-2.43	0.756	56	-10.54	0.297	86	-30.38	0.030
-63	-13.01	0.224	-33	-3.94	0.635	-3	-0.04	0.995	27	-2.62	0.740	57	-10.91	0.285	87	-31.82	0.026
-62	-12.61	0.234	-32	-3.72	0.652	-2	-0.02	0.998	28	-2.81	0.724	58	-11.28	0.273	88	-33.00	0.022
-61	-12.23	0.245	-31	-3.50	0.668	-1	-0.01	0.999	29	-3.01	0.7071	59	-11.66	0.261	89	-33.54	0.021

**Diagrama de Elevação - 2 Elementos**



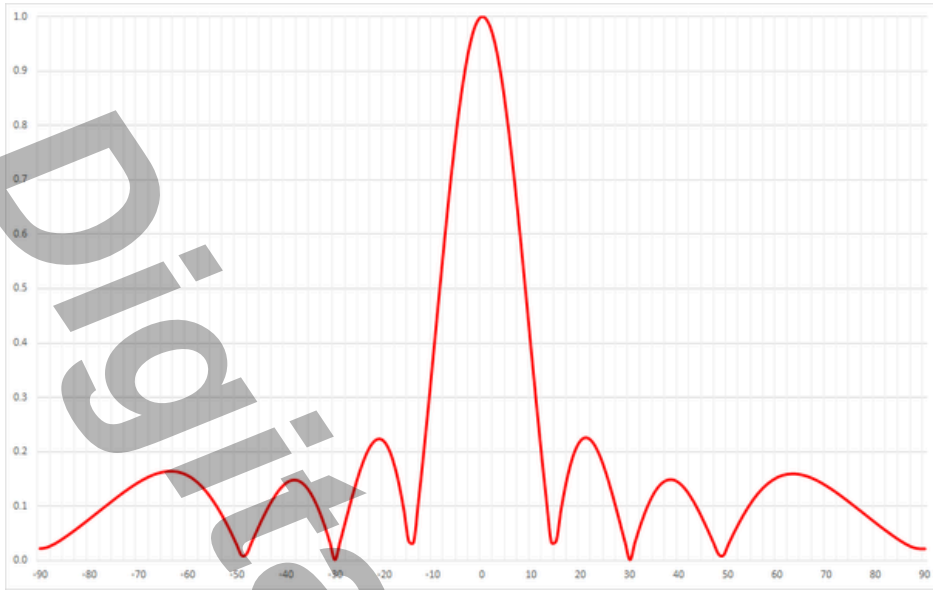
Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
-90	-33.35	0.022	-60	-12.63	0.234	-30	-62.57	0.001	0	0.00	1.000	30	-62.49	0.001	60	-12.83	0.228
-89	-32.93	0.023	-59	-12.37	0.241	-29	-29.72	0.033	1	-0.01	0.999	31	-29.74	0.033	61	-13.13	0.221
-88	-31.81	0.026	-58	-12.13	0.247	-28	-23.36	0.068	2	-0.06	0.993	32	-24.09	0.062	62	-13.44	0.213
-87	-30.40	0.030	-57	-11.91	0.254	-27	-19.59	0.105	3	-0.14	0.984	33	-20.88	0.090	63	-13.77	0.205
-86	-28.97	0.036	-56	-11.72	0.259	-26	-16.88	0.143	4	-0.26	0.971	34	-18.70	0.116	64	-14.13	0.197
-85	-27.62	0.042	-55	-11.54	0.265	-25	-14.74	0.183	5	-0.41	0.954	35	-17.08	0.140	65	-14.50	0.188
-84	-26.38	0.048	-54	-11.39	0.269	-24	-12.98	0.224	6	-0.60	0.933	36	-15.83	0.162	66	-14.89	0.180
-83	-25.25	0.055	-53	-11.26	0.274	-23	-11.47	0.267	7	-0.82	0.910	37	-14.83	0.181	67	-15.31	0.172
-82	-24.22	0.062	-52	-11.15	0.277	-22	-10.17	0.310	8	-1.08	0.883	38	-14.02	0.199	68	-15.74	0.163
-81	-23.28	0.069	-51	-11.08	0.279	-21	-9.01	0.354	9	-1.38	0.853	39	-13.35	0.215	69	-16.19	0.155
-80	-22.41	0.076	-50	-11.03	0.281	-20	-7.98	0.399	10	-1.72	0.820	40	-12.81	0.229	70	-16.67	0.147
-79	-21.61	0.083	-49	-11.01	0.282	-19	-7.06	0.444	11	-2.10	0.785	41	-12.37	0.241	71	-17.17	0.139
-78	-20.86	0.091	-48	-11.03	0.281	-18	-6.22	0.489	12	-2.52	0.748	42	-12.00	0.251	72	-17.70	0.130
-77	-20.17	0.098	-47	-11.08	0.279	-17	-5.46	0.533	13	-2.99	0.709	43	-11.71	0.260	73	-18.26	0.122
-76	-19.51	0.106	-46	-11.17	0.276	-16	-4.77	0.577	14	-3.50	0.668	44	-11.48	0.267	74	-18.84	0.114
-75	-18.89	0.114	-45	-11.30	0.272	-15	-4.14	0.621	15	-4.07	0.626	45	-11.31	0.272	75	-19.47	0.106
-74	-18.31	0.121	-44	-11.49	0.266	-14	-3.57	0.663	16	-4.70	0.582	46	-11.18	0.276	76	-20.12	0.099
-73	-17.76	0.129	-43	-11.73	0.259	-13	-3.05	0.704	17	-5.39	0.538	47	-11.10	0.279	77	-20.83	0.091
-72	-17.24	0.137	-42	-12.02	0.251	-12	-2.58	0.743	18	-6.14	0.493	48	-11.06	0.280	78	-21.58	0.083
-71	-16.74	0.146	-41	-12.39	0.240	-11	-2.15	0.781	19	-6.98	0.448	49	-11.06	0.280	79	-22.38	0.076
-70	-16.26	0.154	-40	-12.85	0.228	-10	-1.77	0.816	20	-7.90	0.403	50	-11.08	0.279	80	-23.25	0.069
-69	-15.81	0.162	-39	-13.40	0.214	-9	-1.42	0.849	21	-8.93	0.358	51	-11.14	0.277	81	-24.19	0.062
-68	-15.38	0.170	-38	-14.07	0.198	-8	-1.12	0.879	22	-10.08	0.313	52	-11.23	0.274	82	-25.22	0.055
-67	-14.97	0.178	-37	-14.88	0.180	-7	-0.86	0.906	23	-11.39	0.269	53	-11.35	0.271	83	-26.35	0.048
-66	-14.58	0.187	-36	-15.89	0.161	-6	-0.63	0.930	24	-12.89	0.227	54	-11.49	0.266	84	-27.59	0.042
-65	-14.21	0.195	-35	-17.15	0.139	-5	-0.44	0.951	25	-14.65	0.185	55	-11.66	0.261	85	-28.94	0.036
-64	-13.86	0.203	-34	-18.77	0.115	-4	-0.28	0.968	26	-16.79	0.145	56	-11.85	0.256	86	-30.38	0.030
-63	-13.52	0.211	-33	-20.96	0.090	-3	-0.16	0.982	27	-19.51	0.106	57	-12.07	0.249	87	-31.82	0.026
-62	-13.21	0.219	-32	-24.16	0.062	-2	-0.07	0.992	28	-23.28	0.069	58	-12.30	0.243	88	-33.00	0.022
-61	-12.91	0.226	-31	-29.82	0.032	-1	-0.02	0.998	29	-29.63	0.033	59	-12.55	0.236	89	-33.54	0.021

**Diagrama de Elevação - 3 Elementos**



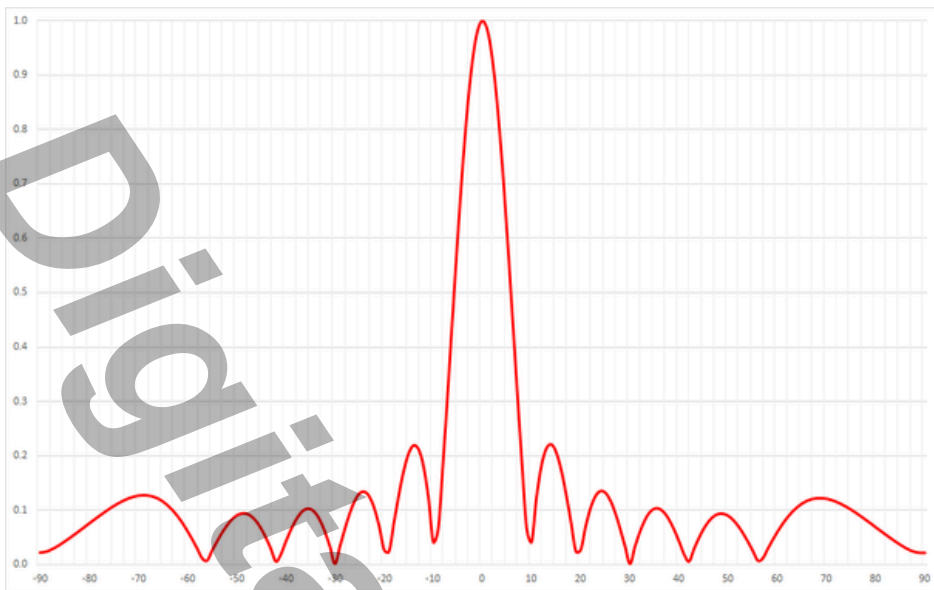
Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
-90	-52.03	0.003	-60	-23.08	0.070	-30	-15.22	0.173	0	0.00	1.000	30	-15.22	0.173	60	-23.08	0.070
-89	-57.22	0.001	-59	-22.76	0.073	-29	-14.94	0.179	1	-0.04	0.995	31	-15.67	0.165	61	-23.45	0.067
-88	-60.55	0.001	-58	-22.49	0.075	-28	-14.84	0.181	2	-0.17	0.981	32	-16.28	0.153	62	-23.86	0.064
-87	-54.65	0.002	-57	-22.27	0.077	-27	-14.93	0.179	3	-0.37	0.958	33	-17.06	0.140	63	-24.31	0.061
-86	-50.06	0.003	-56	-22.11	0.078	-26	-15.25	0.173	4	-0.67	0.926	34	-18.03	0.125	64	-24.80	0.058
-85	-46.86	0.005	-55	-22.02	0.079	-25	-15.83	0.162	5	-1.05	0.886	35	-19.21	0.110	65	-25.33	0.054
-84	-44.41	0.006	-54	-22.00	0.079	-24	-16.77	0.145	6	-1.53	0.838	36	-20.63	0.093	66	-25.89	0.051
-83	-42.41	0.008	-53	-22.06	0.079	-23	-18.19	0.123	7	-2.11	0.784	37	-22.37	0.076	67	-26.49	0.047
-82	-40.71	0.009	-52	-22.22	0.077	-22	-20.41	0.095	8	-2.79	0.725	38	-24.54	0.059	68	-27.12	0.044
-81	-39.22	0.011	-51	-22.48	0.075	-21	-24.16	0.062	9	-3.58	0.662	39	-27.37	0.043	69	-27.78	0.041
-80	-37.87	0.013	-50	-22.87	0.072	-20	-32.89	0.023	10	-4.51	0.595	40	-31.40	0.027	70	-28.48	0.038
-79	-36.65	0.015	-49	-23.42	0.067	-19	-33.05	0.022	11	-5.58	0.526	41	-38.54	0.012	71	-29.22	0.035
-78	-35.52	0.017	-48	-24.17	0.062	-18	-22.79	0.073	12	-6.82	0.456	42	-52.80	0.002	72	-29.99	0.032
-77	-34.46	0.019	-47	-25.18	0.055	-17	-17.87	0.128	13	-8.26	0.386	43	-36.30	0.015	73	-30.79	0.029
-76	-33.47	0.021	-46	-26.55	0.047	-16	-14.54	0.187	14	-9.96	0.318	44	-31.33	0.027	74	-31.64	0.026
-75	-32.53	0.024	-45	-28.47	0.038	-15	-12.00	0.251	15	-12.00	0.251	45	-28.47	0.038	75	-32.53	0.024
-74	-31.64	0.026	-44	-31.33	0.027	-14	-9.96	0.318	16	-14.54	0.187	46	-26.55	0.047	76	-33.47	0.021
-73	-30.79	0.029	-43	-36.30	0.015	-13	-8.26	0.386	17	-17.87	0.128	47	-25.18	0.055	77	-34.46	0.019
-72	-29.99	0.032	-42	-52.80	0.002	-12	-6.82	0.456	18	-22.79	0.073	48	-24.17	0.062	78	-35.52	0.017
-71	-29.22	0.035	-41	-38.54	0.012	-11	-5.58	0.526	19	-33.05	0.022	49	-23.42	0.067	79	-36.65	0.015
-70	-28.48	0.038	-40	-31.40	0.027	-10	-4.51	0.595	20	-32.89	0.023	50	-22.87	0.072	80	-37.87	0.013
-69	-27.78	0.041	-39	-27.37	0.043	-9	-3.58	0.662	21	-24.16	0.062	51	-22.48	0.075	81	-39.22	0.011
-68	-27.12	0.044	-38	-24.54	0.059	-8	-2.79	0.725	22	-20.41	0.095	52	-22.22	0.077	82	-40.71	0.009
-67	-26.49	0.047	-37	-22.37	0.076	-7	-2.11	0.784	23	-18.19	0.123	53	-22.06	0.079	83	-42.41	0.008
-66	-25.89	0.051	-36	-20.63	0.093	-6	-1.53	0.838	24	-16.77	0.145	54	-22.00	0.079	84	-44.41	0.006
-65	-25.33	0.054	-35	-19.21	0.110	-5	-1.05	0.886	25	-15.83	0.162	55	-22.02	0.079	85	-46.86	0.005
-64	-24.80	0.058	-34	-18.03	0.125	-4	-0.67	0.926	26	-15.25	0.173	56	-22.11	0.078	86	-50.06	0.003
-63	-24.31	0.061	-33	-17.06	0.140	-3	-0.37	0.958	27	-14.93	0.179	57	-22.27	0.077	87	-54.65	0.002
-62	-23.86	0.064	-32	-16.28	0.153	-2	-0.17	0.981	28	-14.84	0.181	58	-22.49	0.075	88	-60.55	0.001
-61	-23.45	0.067	-31	-15.67	0.165	-1	-0.04	0.995	29	-14.94	0.1791	59	-22.76	0.073	89	-57.22	0.001

**Diagrama de Elevação - 4 Elementos**



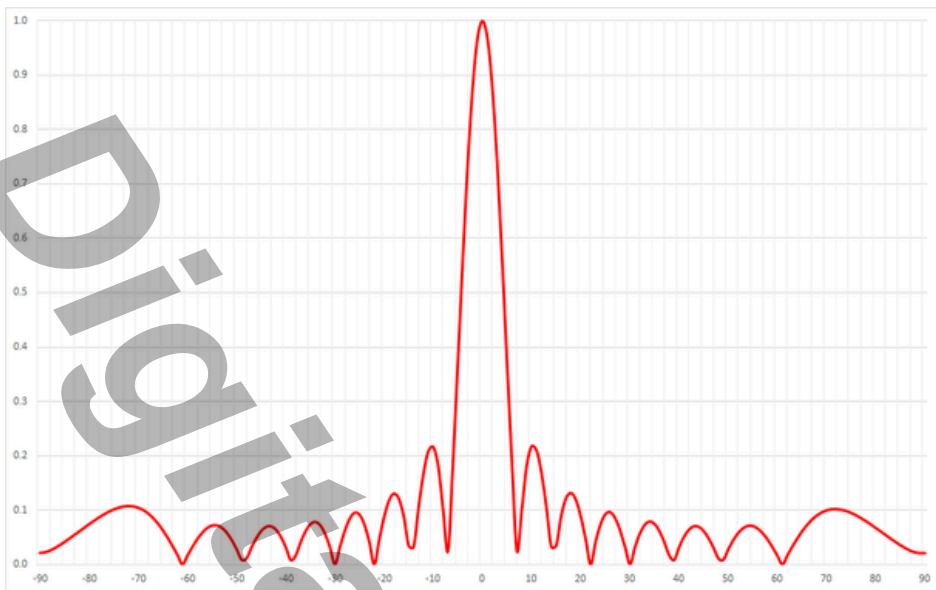
Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
-90	-33.35	0.022	-60	-16.12	0.156	-30	-62.57	0.001	0	0.00	1.000	30	-62.49	0.001	60	-16.32	0.153
-89	-32.93	0.023	-59	-16.43	0.151	-29	-29.75	0.033	1	-0.07	0.992	31	-29.78	0.032	61	-16.12	0.156
-88	-31.81	0.026	-58	-16.85	0.144	-28	-23.52	0.067	2	-0.27	0.969	32	-24.24	0.061	62	-16.01	0.158
-87	-30.40	0.030	-57	-17.40	0.135	-27	-19.96	0.100	3	-0.62	0.931	33	-21.23	0.087	63	-15.97	0.159
-86	-28.97	0.036	-56	-18.10	0.124	-26	-17.54	0.133	4	-1.12	0.879	34	-19.32	0.108	64	-15.99	0.159
-85	-27.62	0.042	-55	-18.99	0.112	-25	-15.80	0.162	5	-1.79	0.814	35	-18.05	0.125	65	-16.08	0.157
-84	-26.38	0.048	-54	-20.12	0.099	-24	-14.55	0.187	6	-2.63	0.739	36	-17.23	0.138	66	-16.22	0.155
-83	-25.26	0.055	-53	-21.59	0.083	-23	-13.69	0.207	7	-3.67	0.655	37	-16.76	0.145	67	-16.42	0.151
-82	-24.23	0.061	-52	-23.55	0.066	-22	-13.19	0.219	8	-4.94	0.566	38	-16.57	0.148	68	-16.66	0.147
-81	-23.30	0.068	-51	-26.31	0.048	-21	-13.02	0.223	9	-6.51	0.473	39	-16.63	0.147	69	-16.96	0.142
-80	-22.45	0.075	-50	-30.69	0.029	-20	-13.21	0.219	10	-8.45	0.378	40	-16.94	0.142	70	-17.30	0.136
-79	-21.66	0.083	-49	-40.67	0.009	-19	-13.83	0.203	11	-10.91	0.285	41	-17.49	0.134	71	-17.68	0.131
-78	-20.94	0.090	-48	-39.02	0.011	-18	-15.01	0.178	12	-14.20	0.195	42	-18.31	0.121	72	-18.11	0.124
-77	-20.27	0.097	-47	-29.96	0.032	-17	-17.02	0.141	13	-19.14	0.110	43	-19.42	0.107	73	-18.58	0.118
-76	-19.66	0.104	-46	-25.67	0.052	-16	-20.60	0.093	14	-29.58	0.033	44	-20.91	0.090	74	-19.10	0.111
-75	-19.09	0.111	-45	-22.90	0.072	-15	-29.10	0.035	15	-29.03	0.035	45	-22.90	0.072	75	-19.66	0.104
-74	-18.56	0.118	-44	-20.91	0.090	-14	-29.65	0.033	16	-20.53	0.094	46	-25.68	0.052	76	-20.27	0.097
-73	-18.08	0.125	-43	-19.43	0.107	-13	-19.20	0.110	17	-16.94	0.142	47	-29.98	0.032	77	-20.93	0.090
-72	-17.64	0.131	-42	-18.33	0.121	-12	-14.26	0.194	18	-14.93	0.179	48	-39.06	0.011	78	-21.65	0.083
-71	-17.24	0.137	-41	-17.52	0.133	-11	-10.96	0.283	19	-13.75	0.205	49	-40.72	0.009	79	-22.43	0.076
-70	-16.89	0.143	-40	-16.98	0.142	-10	-8.50	0.376	20	-13.13	0.221	50	-30.75	0.029	80	-23.29	0.068
-69	-16.58	0.148	-39	-16.68	0.147	-9	-6.55	0.470	21	-12.93	0.226	51	-26.38	0.048	81	-24.22	0.062
-68	-16.31	0.153	-38	-16.62	0.148	-8	-4.99	0.563	22	-13.10	0.221	52	-23.63	0.066	82	-25.23	0.055
-67	-16.08	0.157	-37	-16.81	0.144	-7	-3.70	0.653	23	-13.61	0.209	53	-21.69	0.082	83	-26.36	0.048
-66	-15.91	0.160	-36	-17.29	0.137	-6	-2.66	0.736	24	-14.46	0.189	54	-20.23	0.097	84	-27.59	0.042
-65	-15.79	0.162	-35	-18.12	0.124	-5	-1.81	0.812	25	-15.71	0.164	55	-19.11	0.111	85	-28.94	0.036
-64	-15.72	0.164	-34	-19.39	0.107	-4	-1.15	0.876	26	-17.45	0.134	56	-18.23	0.123	86	-30.38	0.030
-63	-15.72	0.164	-33	-21.31	0.086	-3	-0.64	0.929	27	-19.87	0.102	57	-17.55	0.133	87	-31.82	0.026
-62	-15.77	0.163	-32	-24.32	0.061	-2	-0.28	0.968	28	-23.44	0.067	58	-17.02	0.141	88	-33.00	0.022
-61	-15.91	0.160	-31	-29.86	0.032	-1	-0.07	0.992	29	-29.67	0.0328	59	-16.62	0.148	89	-33.54	0.021

**Diagrama de Elevação - 6 Elementos**



Graus	dB	E/E <sub>max</sub>	Graus	dB	E/E <sub>max</sub>	Graus	dB	E/E <sub>max</sub>	Graus	dB	E/E <sub>max</sub>	Graus	dB	E/E <sub>max</sub>	Graus	dB	E/E <sub>max</sub>
-90	-33.35	0.022	-60	-24.22	0.062	-30	-62.57	0.001	0	0.00	1.000	30	-62.49	0.001	60	-24.42	0.060
-89	-32.93	0.023	-59	-26.80	0.046	-29	-29.82	0.032	1	-0.15	0.983	31	-29.85	0.032	61	-22.62	0.074
-88	-31.81	0.026	-58	-30.81	0.029	-28	-23.79	0.065	2	-0.63	0.930	32	-24.51	0.059	62	-21.29	0.086
-87	-30.40	0.030	-57	-39.08	0.011	-27	-20.58	0.094	3	-1.45	0.846	33	-21.83	0.081	63	-20.30	0.097
-86	-28.97	0.036	-56	-43.21	0.007	-26	-18.69	0.116	4	-2.65	0.737	34	-20.40	0.095	64	-19.57	0.105
-85	-27.62	0.042	-55	-32.13	0.025	-25	-17.70	0.130	5	-4.31	0.609	35	-19.79	0.102	65	-19.03	0.112
-84	-26.39	0.048	-54	-27.58	0.042	-24	-17.50	0.133	6	-6.58	0.469	36	-19.83	0.102	66	-18.65	0.117
-83	-25.27	0.055	-53	-24.81	0.057	-23	-18.10	0.124	7	-9.72	0.327	37	-20.48	0.095	67	-18.42	0.120
-82	-24.26	0.061	-52	-22.97	0.071	-22	-19.74	0.103	8	-14.46	0.189	38	-21.81	0.081	68	-18.31	0.121
-81	-23.34	0.068	-51	-21.73	0.082	-21	-23.12	0.070	9	-23.77	0.065	39	-24.00	0.063	69	-18.30	0.122
-80	-22.51	0.075	-50	-20.95	0.090	-20	-31.50	0.027	10	-27.72	0.041	40	-27.61	0.042	70	-18.38	0.121
-79	-21.75	0.082	-49	-20.59	0.093	-19	-32.55	0.024	11	-18.12	0.124	41	-34.73	0.018	71	-18.55	0.118
-78	-21.07	0.088	-48	-20.62	0.093	-18	-22.30	0.077	12	-14.81	0.182	42	-45.56	0.005	72	-18.80	0.115
-77	-20.45	0.095	-47	-21.08	0.088	-17	-17.85	0.128	13	-13.42	0.213	43	-31.10	0.028	73	-19.13	0.111
-76	-19.90	0.101	-46	-22.04	0.079	-16	-15.27	0.172	14	-13.13	0.221	44	-26.33	0.048	74	-19.52	0.106
-75	-19.41	0.107	-45	-23.67	0.066	-15	-13.80	0.204	15	-13.73	0.206	45	-23.67	0.066	75	-19.98	0.100
-74	-18.99	0.112	-44	-26.33	0.048	-14	-13.20	0.219	16	-15.20	0.174	46	-22.06	0.079	76	-20.51	0.094
-73	-18.63	0.117	-43	-31.11	0.028	-13	-13.48	0.212	17	-17.78	0.129	47	-21.11	0.088	77	-21.11	0.088
-72	-18.34	0.121	-42	-45.58	0.005	-12	-14.87	0.181	18	-22.22	0.077	48	-20.66	0.093	78	-21.78	0.081
-71	-18.12	0.124	-41	-34.76	0.018	-11	-18.18	0.123	19	-32.47	0.024	49	-20.64	0.093	79	-22.52	0.075
-70	-17.97	0.126	-40	-27.65	0.041	-10	-27.77	0.041	20	-31.42	0.027	50	-21.01	0.089	80	-23.35	0.068
-69	-17.92	0.127	-39	-24.04	0.063	-9	-23.81	0.064	21	-23.04	0.070	51	-21.80	0.081	81	-24.25	0.061
-68	-17.95	0.127	-38	-21.86	0.081	-8	-14.50	0.188	22	-19.65	0.104	52	-23.05	0.070	82	-25.26	0.055
-67	-18.09	0.125	-37	-20.54	0.094	-7	-9.76	0.325	23	-18.01	0.126	53	-24.91	0.057	83	-26.37	0.048
-66	-18.34	0.121	-36	-19.89	0.101	-6	-6.61	0.467	24	-17.41	0.135	54	-27.68	0.041	84	-27.60	0.042
-65	-18.74	0.116	-35	-19.85	0.102	-5	-4.34	0.607	25	-17.62	0.132	55	-32.25	0.024	85	-28.94	0.036
-64	-19.30	0.108	-34	-20.47	0.095	-4	-2.67	0.735	26	-18.60	0.117	56	-43.35	0.007	86	-30.38	0.030
-63	-20.05	0.099	-33	-21.91	0.080	-3	-1.46	0.845	27	-20.49	0.095	57	-39.23	0.011	87	-31.82	0.026
-62	-21.06	0.089	-32	-24.59	0.059	-2	-0.64	0.929	28	-23.70	0.065	58	-30.97	0.028	88	-33.00	0.022
-61	-22.40	0.076	-31	-29.93	0.032	-1	-0.16	0.982	29	-29.73	0.0326	59	-26.98	0.045	89	-33.54	0.021

**Diagrama de Elevação - 8 Elementos**



Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax	Graus	dB	E/Emax
-90	-33.35	0.022	-60	-35.70	0.016	-30	-62.57	0.001	0	0.00	1.000	30	-62.49	0.001	60	-35.89	0.016
-89	-32.93	0.023	-59	-29.79	0.032	-29	-29.91	0.032	1	-0.28	0.968	31	-29.94	0.032	61	-67.09	0.000
-88	-31.81	0.026	-58	-26.61	0.047	-28	-24.16	0.062	2	-1.14	0.877	32	-24.89	0.057	62	-35.39	0.017
-87	-30.40	0.030	-57	-24.64	0.059	-27	-21.47	0.084	3	-2.66	0.736	33	-22.71	0.073	63	-29.63	0.033
-86	-28.97	0.036	-56	-23.45	0.067	-26	-20.42	0.095	4	-5.01	0.562	34	-22.02	0.079	64	-26.39	0.048
-85	-27.63	0.042	-55	-22.86	0.072	-25	-20.74	0.092	5	-8.59	0.372	35	-22.52	0.075	65	-24.24	0.061
-84	-26.40	0.048	-54	-22.83	0.072	-24	-22.70	0.073	6	-14.55	0.187	36	-24.24	0.061	66	-22.73	0.073
-83	-25.29	0.054	-53	-23.37	0.068	-23	-27.69	0.041	7	-32.01	0.025	37	-27.74	0.041	67	-21.64	0.083
-82	-24.29	0.061	-52	-24.61	0.059	-22	-68.65	0.000	8	-19.92	0.101	38	-35.60	0.017	68	-20.87	0.090
-81	-23.39	0.068	-51	-26.85	0.045	-21	-26.81	0.046	9	-14.77	0.183	39	-41.11	0.009	69	-20.34	0.096
-80	-22.59	0.074	-50	-30.88	0.029	-20	-21.17	0.087	10	-13.25	0.218	40	-29.81	0.032	70	-20.01	0.100
-79	-21.88	0.081	-49	-40.69	0.009	-19	-18.57	0.118	11	-13.56	0.210	41	-25.77	0.051	71	-19.84	0.102
-78	-21.25	0.087	-48	-39.05	0.011	-18	-17.68	0.131	12	-15.47	0.168	42	-23.80	0.065	72	-19.82	0.102
-77	-20.71	0.092	-47	-30.19	0.031	-17	-18.33	0.121	13	-19.57	0.105	43	-23.02	0.071	73	-19.92	0.101
-76	-20.25	0.097	-46	-26.31	0.048	-16	-21.07	0.088	14	-29.62	0.033	44	-23.16	0.070	74	-20.13	0.099
-75	-19.88	0.101	-45	-24.19	0.062	-15	-29.16	0.035	15	-29.09	0.035	45	-24.20	0.062	75	-20.45	0.095
-74	-19.60	0.105	-44	-23.16	0.070	-14	-29.69	0.033	16	-21.00	0.089	46	-26.32	0.048	76	-20.86	0.091
-73	-19.42	0.107	-43	-23.03	0.071	-13	-19.63	0.104	17	-18.25	0.122	47	-30.21	0.031	77	-21.37	0.085
-72	-19.35	0.108	-42	-23.82	0.064	-12	-15.53	0.167	18	-17.60	0.132	48	-39.08	0.011	78	-21.96	0.080
-71	-19.41	0.107	-41	-25.80	0.051	-11	-13.61	0.209	19	-18.49	0.119	49	-40.74	0.009	79	-22.65	0.074
-70	-19.60	0.105	-40	-29.85	0.032	-10	-13.30	0.216	20	-21.09	0.088	50	-30.94	0.028	80	-23.43	0.067
-69	-19.96	0.100	-39	-41.15	0.009	-9	-14.82	0.182	21	-26.72	0.046	51	-26.92	0.045	81	-24.31	0.061
-68	-20.51	0.094	-38	-35.65	0.017	-8	-19.96	0.100	22	-68.57	0.000	52	-24.70	0.058	82	-25.29	0.054
-67	-21.31	0.086	-37	-27.80	0.041	-7	-32.05	0.025	23	-27.60	0.042	53	-23.47	0.067	83	-26.39	0.048
-66	-22.42	0.076	-36	-24.30	0.061	-6	-14.58	0.187	24	-22.61	0.074	54	-22.94	0.071	84	-27.61	0.042
-65	-23.95	0.063	-35	-22.58	0.074	-5	-8.61	0.371	25	-20.65	0.093	55	-22.98	0.071	85	-28.95	0.036
-64	-26.12	0.049	-34	-22.09	0.079	-4	-5.03	0.560	26	-20.33	0.096	56	-23.59	0.066	86	-30.38	0.030
-63	-29.38	0.034	-33	-22.78	0.073	-3	-2.67	0.735	27	-21.39	0.085	57	-24.79	0.058	87	-31.82	0.026
-62	-35.16	0.017	-32	-24.97	0.056	-2	-1.15	0.876	28	-24.08	0.063	58	-26.77	0.046	88	-33.00	0.022
-61	-66.87	0.000	-31	-30.02	0.032	-1	-0.28	0.968	29	-29.82	0.0323	59	-29.97	0.032	89	-33.54	0.021