



ENGENHARIA DE RADIOFREQUÊNCIA

Datasheet Técnico

Antena FM circular AFMPN

Modelo: AFMPN

Categoria: Broadcast FM

Fonte: Estado não informado

Revisão/Data: não declarada · não declarada

Publicação: versão 1.0



VALIDAÇÃO ON-LINE

EFTX-DS-BROADCAST-FM-AFMPN

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Antena FM omnidirecional em polarização circular
 Antena de alta potência até 8kW por elemento
 Alimentação interna com pressurização plena
 Capacidade de "tilt" e "null-fill"
 Montagem topo / lateral, pré sintonizada em fábrica
 Construção robusta em linha rígida coaxial
 Opções de ganho e separação vertical de λ ou $\lambda/2$

**Especificações****AFMPN**

Faixa de Frequência	FM - 76 até 108 MHz
Polarização	circular direita
Circularidade por polarização	< 2,1 dB @ espaço livre
Relação Axial (RA)	> 0,6 @ espaço livre
Diagrama vertical	"tilt" e "null fill" opcional - CONSULTE
Ganho de potência	vide tabela " Ganho vs. Modelo "
Impedância de entrada	50 Ohms
VSWR máx @ +/- 200 kHz	1,2 : 1 @ montagem topo / 1,5 : 1 @ montagem lateral 1,07 : 1 @ montagem lateral ou topo com sintonizador
Conector de entrada do sistema	EIA 1 5/8", 3 1/8", 4 1/16" compatível com a potência máx especificada
Potência máx por elemento	8kW @ EIA 1 5/8"
Pressurização	plena
Dimensões e esforços	vide tabela " Características Mecânicas "
Velocidade vento máx	180 Km/h

Material da antena	Elementos de cobre, latão e alumínio soldados em processo TIG/MIG Fixadores de inox, Isoladores de PTFE e de fibra de vidro Compatibilidade galvânica entre os vários componentes da antena
Conexões Internas	Linha rígida com conexões internas com tratamento de prata
Montagem	Para cada elemento é fornecido a ferragem padrão para fixação traseira em tubos de diâmetro de 115 a 305 mm
Aterramento	Por intermédio da própria estrutura da antena
Embalagem	Todos os modelos são fornecidos com embalagem em separado para os elementos radiantes, linhas rígidas e ferragem de fixação
Variações	Alimentação inferior (end-feed) ou central (center-feed) com linha rígida Configurações acima de 8 níveis de empilhamento – CONSULTE Diagramas dedicados ou direcionais – CONSULTE Opção de separação $\lambda/2$ para redução de radiação não ionizante

AFMPN – {# níveis} – {frequência} – {potência}

1,2,3,4,5,6,7,8

76 até 108

em kW

Biblioteca com diagramas de radiação e composições especiais "tilt" e "null-fill" disponíveis para edição e download
 Antenna Composer EFTX

Disponível para assinantes .

Ganho vs. Modelo

Modelo	x dip.	dBd
AFMPN-1	0,5	-2,83
AFMPN-2	1,08	0,35
AFMPN-3	1,65	2,18
AFMPN-4	2,26	3,47
AFMPN-5	2,82	4,46
AFMPN-6	3,43	5,35
AFMPN-7	4,0	5,94
AFMPN-8	4,53	6,53

ganho para cada componente de polarização sem "tilt" e "null fill"

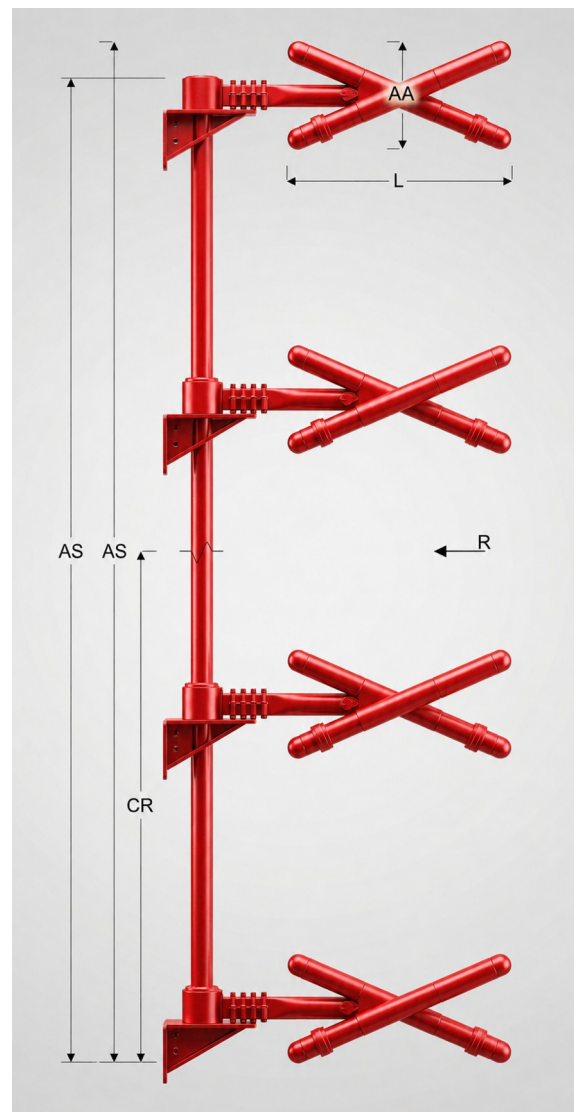
Características Mecânicas – dimensões e esforços

Modelo	MHz	Lateral		Topo	
		AS(°)	CR	AS	CR
AFMPN-1	76	0,52	0,26	2,52	2,26
	88	0,52	0,26	2,52	2,26
	98	0,52	0,26	2,52	2,26
	108	0,52	0,26	2,52	2,26
AFMPN-2	76	4,47	2,23	6,47	4,23
	88	3,93	1,96	5,93	3,96
	98	3,58	1,79	5,58	3,79
	108	3,30	1,65	5,30	3,65
AFMPN-3	76	8,41	4,21	10,41	6,21
	88	7,34	3,67	9,34	5,67
	98	6,64	3,32	8,64	5,32
	108	6,08	3,04	8,08	5,04
AFMPN-4	76	12,36	6,18	14,36	8,18
	88	10,7	5,37	12,7	7,37
	98	9,70	4,85	11,7	6,85
	108	8,85	4,43	10,9	6,43
AFMPN-5	76	16,31	8,15	18,31	10,15
	88	14,2	7,08	16,2	9,08
	98	12,8	6,38	14,8	8,38
	108	11,6	5,82	13,6	7,82
AFMPN-6	76	20,26	10,13	22,26	12,13
	88	17,6	8,78	19,6	10,8
	98	15,8	7,91	17,8	9,91
	108	14,4	7,20	16,4	9,20
AFMPN-7	76	24,20	12,10	26,20	14,10
	88	21,0	10,5	23,0	12,5
	98	18,9	9,44	20,9	11,4
	108	17,2	8,59	19,2	10,6
AFMPN-8	76	28,15	14,08	30,15	16,08
	88	24,4	12,2	26,4	14,2
	98	21,9	11,0	23,9	13,0
	108	20,0	9,98	22,0	12,0

acrescentar aprox. 2,4 m para alimentação inferior (end feed)

Modelo	AA	L	AE	P
AFMPN-1	0,52	0,45	0,3	16
AFMPN-2			1,2	35
AFMPN-3			1,9	54
AFMPN-4			2,5	72
AFMPN-5			3,2	90
AFMPN-6			3,8	108
AFMPN-7			4,5	126
AFMPN-8			5,1	144

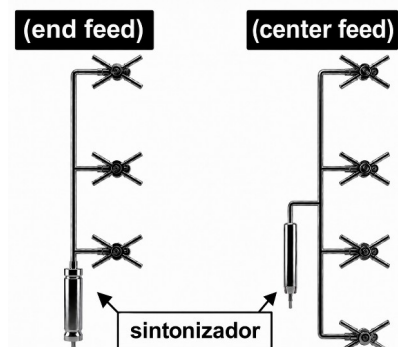
AE e P considerando interconexão dos elementos em linha rígida de 1 5/8"

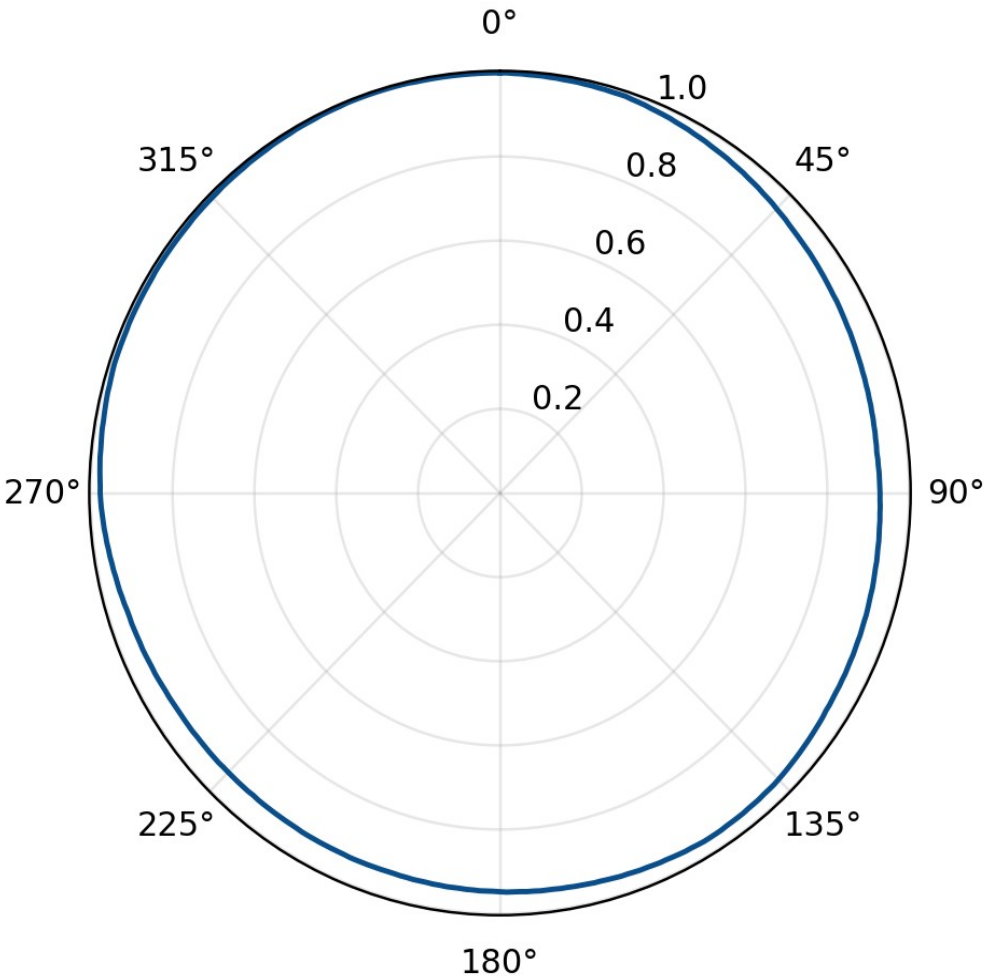


AS altura do sistema em m
CR centro de radiação em m
AA altura da antena em m
L largura da antena em m
AE área de exposição (CaAc) em m²
P peso da antena em Kg

Alimentação com LINHA RÍGIDA

Antenas especificadas com "tilt" e / ou "null -fill" são fornecidas com alimentação central ("center feed") e devem apresentar preferencialmente número par de níveis.





Parâmetros da configuração

ÂNGULO DE MEIA POTÊNCIA HORIZONTAL

359.00°

GANHO

-2.83 dBd

FRENTE/COSTAS

0.30 dB

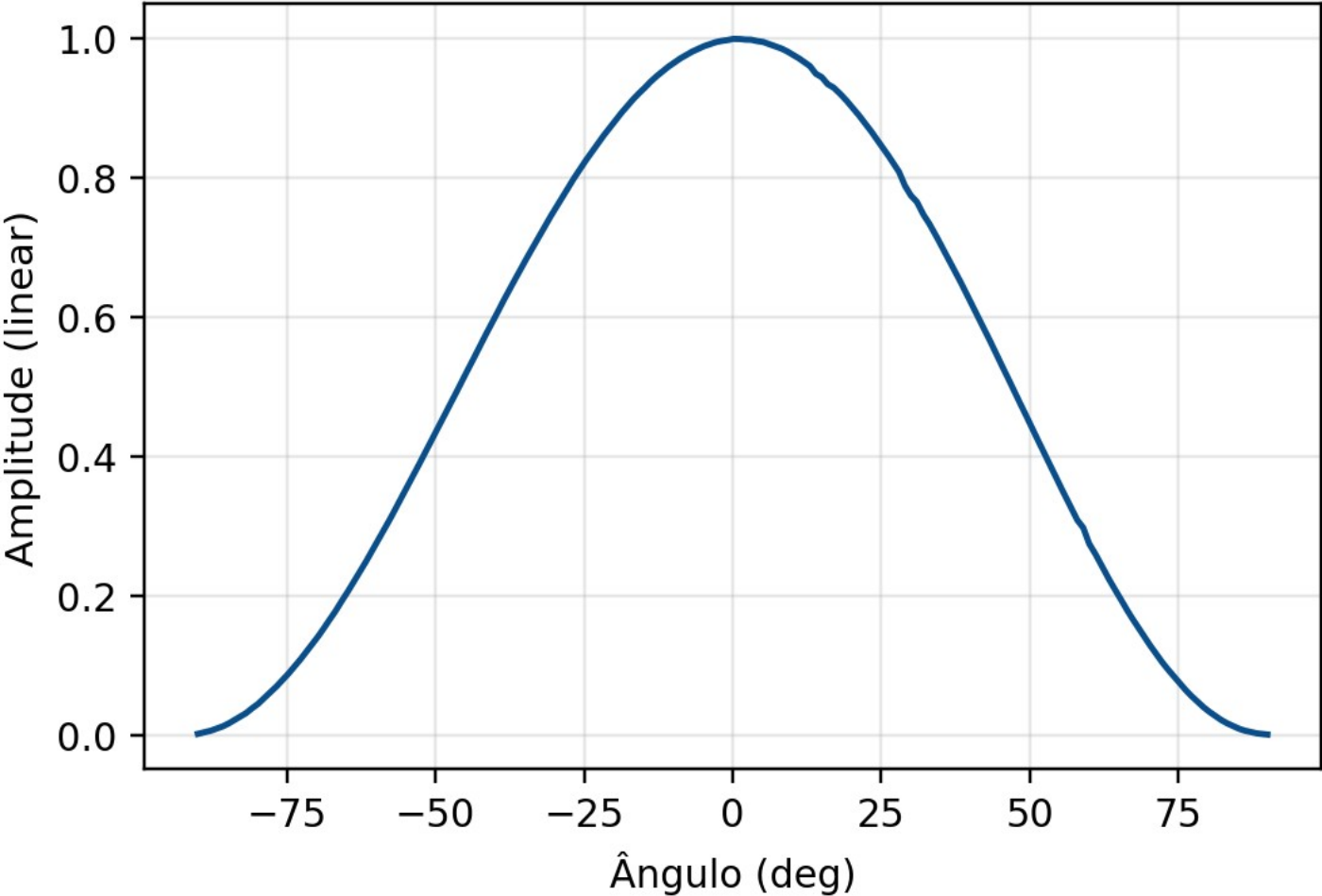
RIPPLE

0.67 dB

Tabela completa - Azimute



Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB
0°	0.9990	0.01	73°	0.9320	0.61	146°	0.9670	0.29	219°	0.9390	0.55	292°	0.9910	0.08
1°	0.9990	0.01	74°	0.9310	0.62	147°	0.9670	0.29	220°	0.9380	0.56	293°	0.9910	0.08
2°	0.9980	0.02	75°	0.9310	0.62	148°	0.9670	0.29	221°	0.9390	0.55	294°	0.9920	0.07
3°	0.9980	0.02	76°	0.9300	0.63	149°	0.9670	0.29	222°	0.9390	0.55	295°	0.9920	0.07
4°	0.9970	0.03	77°	0.9300	0.63	150°	0.9660	0.30	223°	0.9390	0.55	296°	0.9920	0.07
5°	0.9970	0.03	78°	0.9290	0.64	151°	0.9650	0.31	224°	0.9390	0.55	297°	0.9920	0.07
6°	0.9970	0.03	79°	0.9290	0.64	152°	0.9650	0.31	225°	0.9390	0.55	298°	0.9920	0.07
7°	0.9960	0.03	80°	0.9280	0.65	153°	0.9640	0.32	226°	0.9390	0.55	299°	0.9920	0.07
8°	0.9960	0.03	81°	0.9280	0.65	154°	0.9630	0.33	227°	0.9400	0.54	300°	0.9920	0.07
9°	0.9950	0.04	82°	0.9270	0.66	155°	0.9620	0.34	228°	0.9400	0.54	301°	0.9920	0.07
10°	0.9950	0.04	83°	0.9270	0.66	156°	0.9620	0.34	229°	0.9400	0.54	302°	0.9930	0.06
11°	0.9950	0.04	84°	0.9260	0.67	157°	0.9610	0.35	230°	0.9400	0.54	303°	0.9930	0.06
12°	0.9940	0.05	85°	0.9270	0.66	158°	0.9600	0.35	231°	0.9400	0.54	304°	0.9930	0.06
13°	0.9940	0.05	86°	0.9270	0.66	159°	0.9600	0.35	232°	0.9400	0.54	305°	0.9930	0.06
14°	0.9930	0.06	87°	0.9280	0.65	160°	0.9590	0.36	233°	0.9410	0.53	306°	0.9930	0.06
15°	0.9930	0.06	88°	0.9280	0.65	161°	0.9580	0.37	234°	0.9410	0.53	307°	0.9930	0.06
16°	0.9920	0.07	89°	0.9280	0.65	162°	0.9580	0.37	235°	0.9410	0.53	308°	0.9930	0.06
17°	0.9920	0.07	90°	0.9290	0.64	163°	0.9570	0.38	236°	0.9410	0.53	309°	0.9930	0.06
18°	0.9920	0.07	91°	0.9290	0.64	164°	0.9560	0.39	237°	0.9410	0.53	310°	0.9930	0.06
19°	0.9900	0.09	92°	0.9300	0.63	165°	0.9550	0.40	238°	0.9420	0.52	311°	0.9940	0.05
20°	0.9890	0.10	93°	0.9300	0.63	166°	0.9550	0.40	239°	0.9430	0.51	312°	0.9940	0.05
21°	0.9880	0.10	94°	0.9310	0.62	167°	0.9540	0.41	240°	0.9430	0.51	313°	0.9940	0.05
22°	0.9860	0.12	95°	0.9310	0.62	168°	0.9530	0.42	241°	0.9440	0.50	314°	0.9940	0.05
23°	0.9850	0.13	96°	0.9320	0.61	169°	0.9530	0.42	242°	0.9450	0.49	315°	0.9940	0.05
24°	0.9840	0.14	97°	0.9330	0.60	170°	0.9520	0.43	243°	0.9460	0.48	316°	0.9940	0.05
25°	0.9830	0.15	98°	0.9330	0.60	171°	0.9520	0.43	244°	0.9460	0.48	317°	0.9950	0.04
26°	0.9810	0.17	99°	0.9340	0.59	172°	0.9510	0.44	245°	0.9470	0.47	318°	0.9950	0.04
27°	0.9800	0.18	100°	0.9350	0.58	173°	0.9510	0.44	246°	0.9480	0.46	319°	0.9950	0.04
28°	0.9790	0.18	101°	0.9350	0.58	174°	0.9510	0.44	247°	0.9490	0.45	320°	0.9950	0.04
29°	0.9770	0.20	102°	0.9360	0.57	175°	0.9500	0.45	248°	0.9490	0.45	321°	0.9950	0.04
30°	0.9760	0.21	103°	0.9370	0.57	176°	0.9500	0.45	249°	0.9500	0.45	322°	0.9960	0.03
31°	0.9750	0.22	104°	0.9380	0.56	177°	0.9490	0.45	250°	0.9510	0.44	323°	0.9960	0.03
32°	0.9730	0.24	105°	0.9380	0.56	178°	0.9490	0.45	251°	0.9520	0.43	324°	0.9960	0.03
33°	0.9720	0.25	106°	0.9390	0.55	179°	0.9490	0.45	252°	0.9520	0.43	325°	0.9960	0.03
34°	0.9710	0.26	107°	0.9400	0.54	180°	0.9480	0.46	253°	0.9530	0.42	326°	0.9970	0.03
35°	0.9700	0.26	108°	0.9410	0.53	181°	0.9470	0.47	254°	0.9550	0.40	327°	0.9970	0.03
36°	0.9680	0.28	109°	0.9410	0.53	182°	0.9470	0.47	255°	0.9560	0.39	328°	0.9970	0.03
37°	0.9670	0.29	110°	0.9420	0.52	183°	0.9470	0.47	256°	0.9580	0.37	329°	0.9970	0.03
38°	0.9660	0.30	111°	0.9430	0.51	184°	0.9460	0.48	257°	0.9590	0.36	330°	0.9980	0.02
39°	0.9640	0.32	112°	0.9430	0.51	185°	0.9460	0.48	258°	0.9600	0.35	331°	0.9980	0.02
40°	0.9630	0.33	113°	0.9440	0.50	186°	0.9450	0.49	259°	0.9620	0.34	332°	0.9980	0.02
41°	0.9620	0.34	114°	0.9450	0.49	187°	0.9450	0.49	260°	0.9630	0.33	333°	0.9980	0.02
42°	0.9600	0.35	115°	0.9450	0.49	188°	0.9450	0.49	261°	0.9650	0.31	334°	0.9990	0.01
43°	0.9590	0.36	116°	0.9460	0.48	189°	0.9440	0.50	262°	0.9660	0.30	335°	0.9990	0.01
44°	0.9580	0.37	117°	0.9470	0.47	190°	0.9440	0.50	263°	0.9680	0.28	336°	0.9990	0.01
45°	0.9560	0.39	118°	0.9470	0.47	191°	0.9430	0.51	264°	0.9690	0.27	337°	0.9990	0.01
46°	0.9550	0.40	119°	0.9480	0.46	192°	0.9430	0.51	265°	0.9710	0.26	338°	1.0000	0.00
47°	0.9540	0.41	120°	0.9480	0.46	193°	0.9430	0.51	266°	0.9720	0.25	339°	1.0000	0.00
48°	0.9520	0.43	121°	0.9490	0.45	194°	0.9420	0.52	267°	0.9730	0.24	340°	1.0000	0.00
49°	0.9510	0.44	122°	0.9500	0.45	195°	0.9420	0.52	268°	0.9750	0.22	341°	1.0000	0.00
50°	0.9500	0.45	123°	0.9500	0.45	196°	0.9410	0.53	269°	0.9760	0.21	342°	1.0000	0.00
51°	0.9490	0.45	124°	0.9520	0.43	197°	0.9410	0.53	270°	0.9770	0.20	343°	1.0000	0.00
52°	0.9480	0.46	125°	0.9530	0.42	198°	0.9410	0.53	271°	0.9770	0.20	344°	1.0000	0.00
53°	0.9480	0.46	126°	0.9540	0.41	199°	0.9410	0.53	272°	0.9780	0.19	345°	1.0000	0.00
54°	0.9470	0.47	127°	0.9550	0.40	200°	0.9410	0.53	273°	0.9790	0.18	346°	1.0000	0.00
55°	0.9460	0.48	128°	0.9560	0.39	201°	0.9410	0.53	274°	0.9800	0.18	347°	1.0000	0.00
56°	0.9450	0.49	129°	0.9570	0.38	202°	0.9410	0.53	275°	0.9810	0.17	348°	0.9990	0.01
57°	0.9440	0.50	130°	0.9580	0.37	203°	0.9410	0.53	276°	0.9810	0.17	349°	0.9990	0.01
58°	0.9430	0.51	131°	0.9590	0.36	204°	0.9400	0.54	277°	0.9820	0.16	350°	0.9990	0.01
59°	0.9420	0.52	132°	0.9600	0.35	205°	0.9400	0.54	278°	0.9830	0.15	351°	0.9990	0.01
60°	0.9410	0.53	133°	0.9610	0.35	206°	0.9400	0.54	279°	0.9840	0.14	352°	0.9990	0.01
61°	0.9410	0.53	134°	0.9620	0.34	207°	0.9400	0.54	280°	0.9840	0.14	353°	0.9990	0.01
62°	0.9400	0.54	135°	0.9630	0.33	208°	0.9400	0.54	281°	0.9850	0.13	354°	0.9990	0.01
63°	0.9390	0.55	136°	0.9640	0.32	209°	0.9400	0.54	282°	0.9860	0.12	355°	0.9990	0.01
64°	0.9380	0.56	137°	0.9640	0.32	210°	0.9400	0.54	283°	0.9870	0.11	356°	0.9990	0.01
65°	0.9370	0.57	138°	0.9640	0.32	211°	0.9400	0.54	284°	0.9880	0.10	357°	0.9990	0.01
66°	0.9370	0.57	139°	0.9650	0.31	212°	0.9390	0.55	285°	0.9880	0.10	358°	0.9990	0.01
67°	0.9360	0.57	140°	0.9650	0.31	213°	0.9390	0.55	286°	0.9890	0.10	359°	0.9990	0.01
68°	0.9350	0.58	141°	0.9650	0.31	214°	0.9390	0.55	287°	0.9900	0.09	360°	0.9990	0.01
69°	0.9340	0.59	142°	0.9660	0.30	215°	0.9390	0.55	288°	0.9910	0.08			
70°	0.9330	0.60	143°	0.9660	0.30	216°	0.9390	0.55	289°	0.9910	0.08			
71°	0.9330	0.60	144°	0.9660	0.30	217°	0.9390	0.55	290°	0.9910	0.08			
72°	0.9320	0.61	145°	0.9660	0.30	218°	0.9390	0.55	291°	0.9910	0.08			



Parâmetros da configuração

ELEMENTOS VERTICAIS

1

ÂNGULO DE MEIA POTÊNCIA VERTICAL

68.19°

GANHO

-2.83 dBd

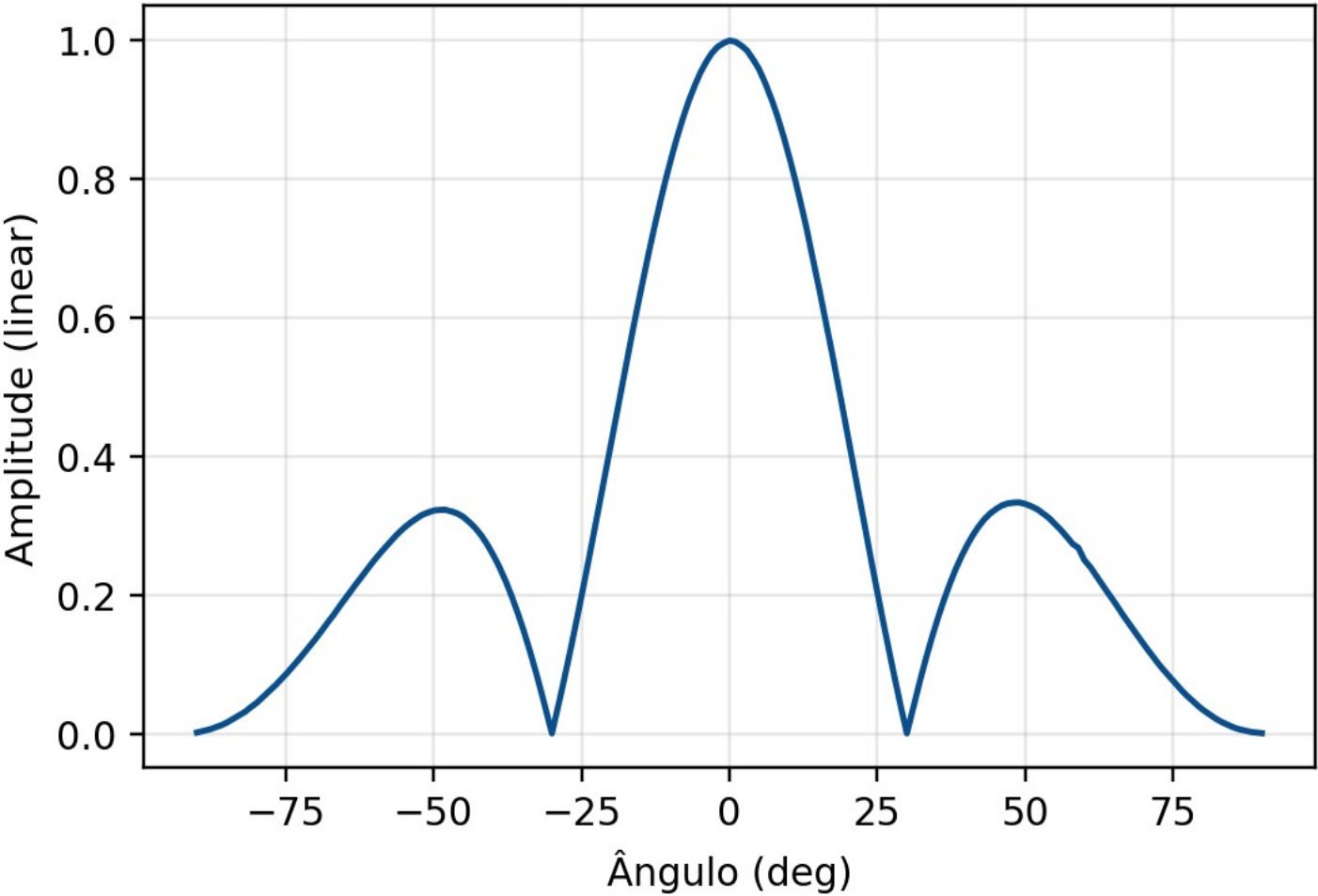
PRIMEIRO NULO

78.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.3690	8.66	-18.0°	0.9010	0.91	18.0°	0.9220	0.71	54.0°	0.3780	8.45
-89.5°	0.0030	50.46	-53.5°	0.3770	8.47	-17.5°	0.9060	0.86	18.5°	0.9175	0.75	54.5°	0.3690	8.66
-89.0°	0.0040	47.96	-53.0°	0.3850	8.29	-17.0°	0.9110	0.81	19.0°	0.9130	0.79	55.0°	0.3600	8.87
-88.5°	0.0050	46.02	-52.5°	0.3935	8.10	-16.5°	0.9155	0.77	19.5°	0.9080	0.84	55.5°	0.3515	9.08
-88.0°	0.0060	44.44	-52.0°	0.4020	7.92	-16.0°	0.9200	0.72	20.0°	0.9030	0.89	56.0°	0.3430	9.29
-87.5°	0.0075	42.50	-51.5°	0.4100	7.74	-15.5°	0.9240	0.69	20.5°	0.8980	0.93	56.5°	0.3345	9.51
-87.0°	0.0090	40.92	-51.0°	0.4180	7.58	-15.0°	0.9280	0.65	21.0°	0.8930	0.98	57.0°	0.3260	9.74
-86.5°	0.0105	39.58	-50.5°	0.4265	7.40	-14.5°	0.9325	0.61	21.5°	0.8875	1.04	57.5°	0.3175	9.97
-86.0°	0.0120	38.42	-50.0°	0.4350	7.23	-14.0°	0.9370	0.57	22.0°	0.8820	1.09	58.0°	0.3090	10.20
-85.5°	0.0140	37.08	-49.5°	0.4430	7.07	-13.5°	0.9410	0.53	22.5°	0.8765	1.14	58.5°	0.3035	10.36
-85.0°	0.0160	35.92	-49.0°	0.4510	6.92	-13.0°	0.9450	0.49	23.0°	0.8710	1.20	59.0°	0.2980	10.52
-84.5°	0.0185	34.66	-48.5°	0.4595	6.75	-12.5°	0.9485	0.46	23.5°	0.8650	1.26	59.5°	0.2865	10.86
-84.0°	0.0210	33.56	-48.0°	0.4680	6.60	-12.0°	0.9520	0.43	24.0°	0.8590	1.32	60.0°	0.2750	11.21
-83.5°	0.0235	32.58	-47.5°	0.4760	6.45	-11.5°	0.9555	0.40	24.5°	0.8530	1.38	60.5°	0.2680	11.44
-83.0°	0.0260	31.70	-47.0°	0.4840	6.30	-11.0°	0.9590	0.36	25.0°	0.8470	1.44	61.0°	0.2610	11.67
-82.5°	0.0285	30.90	-46.5°	0.4925	6.15	-10.5°	0.9620	0.34	25.5°	0.8410	1.50	61.5°	0.2530	11.94
-82.0°	0.0310	30.17	-46.0°	0.5010	6.00	-10.0°	0.9650	0.31	26.0°	0.8350	1.57	62.0°	0.2450	12.22
-81.5°	0.0345	29.24	-45.5°	0.5095	5.86	-9.5°	0.9680	0.28	26.5°	0.8285	1.63	62.5°	0.2370	12.51
-81.0°	0.0380	28.40	-45.0°	0.5180	5.71	-9.0°	0.9710	0.26	27.0°	0.8220	1.70	63.0°	0.2290	12.80
-80.5°	0.0410	27.74	-44.5°	0.5260	5.58	-8.5°	0.9735	0.23	27.5°	0.8155	1.77	63.5°	0.2215	13.09
-80.0°	0.0440	27.13	-44.0°	0.5340	5.45	-8.0°	0.9760	0.21	28.0°	0.8090	1.84	64.0°	0.2140	13.39
-79.5°	0.0480	26.38	-43.5°	0.5425	5.31	-7.5°	0.9785	0.19	28.5°	0.7990	1.95	64.5°	0.2070	13.68
-79.0°	0.0520	25.68	-43.0°	0.5510	5.18	-7.0°	0.9810	0.17	29.0°	0.7890	2.06	65.0°	0.2000	13.98
-78.5°	0.0560	25.04	-42.5°	0.5595	5.04	-6.5°	0.9830	0.15	29.5°	0.7820	2.14	65.5°	0.1925	14.31
-78.0°	0.0600	24.44	-42.0°	0.5680	4.91	-6.0°	0.9850	0.13	30.0°	0.7750	2.21	66.0°	0.1850	14.66
-77.5°	0.0640	23.88	-41.5°	0.5760	4.79	-5.5°	0.9870	0.11	30.5°	0.7705	2.26	66.5°	0.1780	14.99
-77.0°	0.0680	23.35	-41.0°	0.5840	4.67	-5.0°	0.9890	0.10	31.0°	0.7660	2.32	67.0°	0.1710	15.34
-76.5°	0.0725	22.79	-40.5°	0.5920	4.55	-4.5°	0.9905	0.08	31.5°	0.7575	2.41	67.5°	0.1645	15.68
-76.0°	0.0770	22.27	-40.0°	0.6000	4.44	-4.0°	0.9920	0.07	32.0°	0.7490	2.51	68.0°	0.1580	16.03
-75.5°	0.0815	21.78	-39.5°	0.6085	4.31	-3.5°	0.9935	0.06	32.5°	0.7425	2.59	68.5°	0.1515	16.39
-75.0°	0.0860	21.31	-39.0°	0.6170	4.19	-3.0°	0.9950	0.04	33.0°	0.7360	2.66	69.0°	0.1450	16.77
-74.5°	0.0910	20.82	-38.5°	0.6250	4.08	-2.5°	0.9960	0.03	33.5°	0.7285	2.75	69.5°	0.1385	17.17
-74.0°	0.0960	20.35	-38.0°	0.6330	3.97	-2.0°	0.9970	0.03	34.0°	0.7210	2.84	70.0°	0.1320	17.59
-73.5°	0.1010	19.91	-37.5°	0.6410	3.86	-1.5°	0.9975	0.02	34.5°	0.7130	2.94	70.5°	0.1260	17.99
-73.0°	0.1060	19.49	-37.0°	0.6490	3.76	-1.0°	0.9980	0.02	35.0°	0.7050	3.04	71.0°	0.1200	18.42
-72.5°	0.1115	19.05	-36.5°	0.6565	3.66	-0.5°	0.9990	0.01	35.5°	0.6970	3.14	71.5°	0.1140	18.86
-72.0°	0.1170	18.64	-36.0°	0.6640	3.56	0.0°	1.0000	0.00	36.0°	0.6890	3.24	72.0°	0.1080	19.33
-71.5°	0.1225	18.24	-35.5°	0.6720	3.45	0.5°	1.0000	0.00	36.5°	0.6810	3.34	72.5°	0.1025	19.79
-71.0°	0.1280	17.86	-35.0°	0.6800	3.35	1.0°	1.0000	0.00	37.0°	0.6730	3.44	73.0°	0.0970	20.26
-70.5°	0.1335	17.49	-34.5°	0.6875	3.25	1.5°	0.9995	0.00	37.5°	0.6650	3.54	73.5°	0.0920	20.72
-70.0°	0.1390	17.14	-34.0°	0.6950	3.16	2.0°	0.9990	0.01	38.0°	0.6570	3.65	74.0°	0.0870	21.21
-69.5°	0.1450	16.77	-33.5°	0.7025	3.07	2.5°	0.9990	0.01	38.5°	0.6485	3.76	74.5°	0.0820	21.72
-69.0°	0.1510	16.42	-33.0°	0.7100	2.97	3.0°	0.9990	0.01	39.0°	0.6400	3.88	75.0°	0.0770	22.27
-68.5°	0.1575	16.05	-32.5°	0.7175	2.88	3.5°	0.9980	0.02	39.5°	0.6315	3.99	75.5°	0.0720	22.85
-68.0°	0.1640	15.70	-32.0°	0.7250	2.79	4.0°	0.9970	0.03	40.0°	0.6230	4.11	76.0°	0.0670	23.48
-67.5°	0.1700	15.39	-31.5°	0.7325	2.70	4.5°	0.9965	0.03	40.5°	0.6145	4.23	76.5°	0.0625	24.08
-67.0°	0.1760	15.09	-31.0°	0.7400	2.62	5.0°	0.9960	0.03	41.0°	0.6060	4.35	77.0°	0.0580	24.73
-66.5°	0.1830	14.75	-30.5°	0.7470	2.53	5.5°	0.9945	0.05	41.5°	0.5975	4.47	77.5°	0.0540	25.35
-66.0°	0.1900	14.42	-30.0°	0.7540	2.45	6.0°	0.9930	0.06	42.0°	0.5890	4.60	78.0°	0.0500	26.02
-65.5°	0.1965	14.13	-29.5°	0.7610	2.37	6.5°	0.9915	0.07	42.5°	0.5805	4.72	78.5°	0.0460	26.74
-65.0°	0.2030	13.85	-29.0°	0.7680	2.29	7.0°	0.9900	0.09	43.0°	0.5720	4.85	79.0°	0.0420	27.53
-64.5°	0.2100	13.56	-28.5°	0.7750	2.21	7.5°	0.9885	0.10	43.5°	0.5630	4.99	79.5°	0.0385	28.29
-64.0°	0.2170	13.27	-28.0°	0.7820	2.14	8.0°	0.9870	0.11	44.0°	0.5540	5.13	80.0°	0.0350	29.12
-63.5°	0.2240	13.00	-27.5°	0.7890	2.06	8.5°	0.9850	0.13	44.5°	0.5450	5.27	80.5°	0.0320	29.90
-63.0°	0.2310	12.73	-27.0°	0.7960	1.98	9.0°	0.9830	0.15	45.0°	0.5360	5.42	81.0°	0.0290	30.75
-62.5°	0.2380	12.47	-26.5°	0.8025	1.91	9.5°	0.9805	0.17	45.5°	0.5275	5.56	81.5°	0.0260	31.70
-62.0°	0.2450	12.22	-26.0°	0.8090	1.84	10.0°	0.9780	0.19	46.0°	0.5190	5.70	82.0°	0.0230	32.77
-61.5°	0.2525	11.95	-25.5°	0.8155	1.77	10.5°	0.9755	0.22	46.5°	0.5100	5.85	82.5°	0.0205	33.76
-61.0°	0.2600	11.70	-25.0°	0.8220	1.70	11.0°	0.9730	0.24	47.0°	0.5010	6.00	83.0°	0.0180	34.89
-60.5°	0.2675	11.45	-24.5°	0.8280	1.64	11.5°	0.9700	0.26	47.5°	0.4920	6.16	83.5°	0.0160	35.92
-60.0°	0.2750	11.21	-24.0°	0.8340	1.58	12.0°	0.9670	0.29	48.0°	0.4830	6.32	84.0°	0.0140	37.08
-59.5°	0.2825	10.98	-23.5°	0.8400	1.51	12.5°	0.9640	0.32	48.5°	0.4745	6.48	84.5°	0.0120	38.42
-59.0°	0.2900	10.75	-23.0°	0.8460	1.45	13.0°	0.9610	0.35	49.0°	0.4660	6.63	85.0°	0.0100	40.00
-58.5°	0.2975	10.53	-22.5°	0.8520	1.39	13.5°	0.9555	0.40	49.5°	0.4570	6.80	85.5°	0.0085	41.41
-58.0°	0.3050	10.31	-22.0°	0.8580	1.33	14.0°	0.9500	0.45	50.0°	0.4480	6.97	86.0°	0.0070	43.10
-57.5°	0.3130	10.09	-21.5°	0.8635	1.27	14.5°	0.9475	0.47	50.5°	0.4390	7.15	86.5°	0.0060	44.44
-57.0°	0.3210	9.87	-21.0°	0.8690	1.22	15.0°	0.9450	0.49	51.0°	0.4300	7.33	87.0°	0.0050	46.02
-56.5°	0.3290	9.66	-20.5°	0.8745	1.16	15.5°	0.9400	0.54	51.5°	0.4215	7.50	87.5°	0.0040	47.96
-56.0°	0.3370	9.45	-20.0°	0.8800	1.11	16.0°	0.9350	0.58	52.0°	0.4130	7.68	88.0°	0.0030	50.46
-55.5°	0.3450	9.24	-19.5°	0.8855	1.06	16.5°	0.9325	0.61	52.5°	0.4040	7.87	88.5°	0.0025	52.04
-55.0°	0.3530	9.04	-19.0°	0.8910	1.00	17.0°	0.9300	0.63	53.0°	0.3950	8.07	89.0°	0.0020	53.98
-54.5°	0.3610	8.85	-18.5°	0.8960	0.95	17.5°	0.9260	0.67	53.5°	0.3865	8.26	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

2

ÂNGULO DE MEIA POTÊNCIA VERTICAL

27.30°

GANHO

0.35 dBd

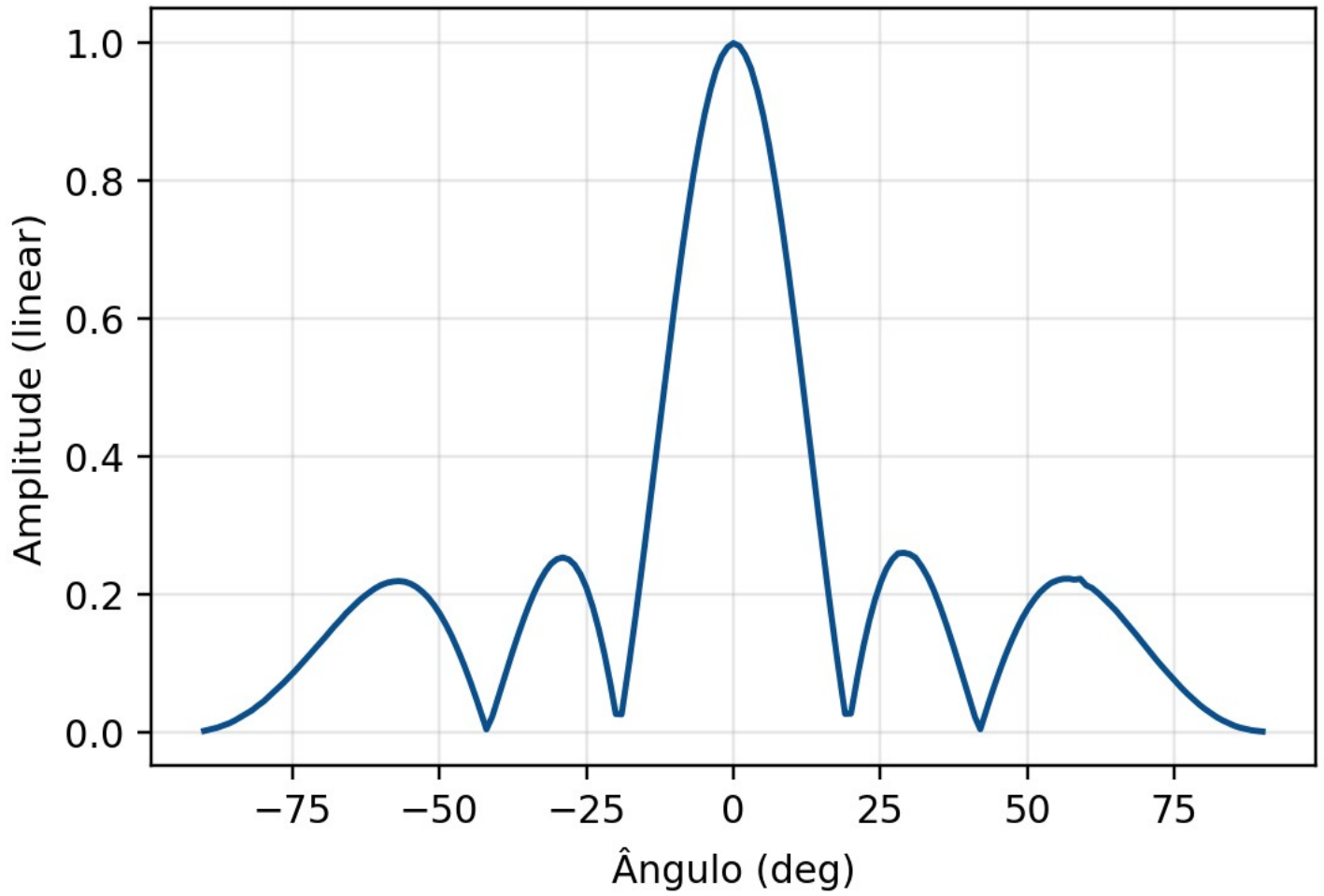
PRIMEIRO NULO

29.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.3042	10.34	-18.0°	0.5092	5.86	18.0°	0.5211	5.66	54.0°	0.3116	10.13
-89.5°	0.0030	50.46	-53.5°	0.3072	10.25	-17.5°	0.5313	5.49	18.5°	0.4986	6.04	54.5°	0.3074	10.25
-89.0°	0.0040	47.96	-53.0°	0.3101	10.17	-17.0°	0.5534	5.14	19.0°	0.4762	6.44	55.0°	0.3031	10.37
-88.5°	0.0050	46.02	-52.5°	0.3129	10.09	-16.5°	0.5750	4.81	19.5°	0.4534	6.87	55.5°	0.2988	10.49
-88.0°	0.0060	44.44	-52.0°	0.3157	10.01	-16.0°	0.5965	4.49	20.0°	0.4306	7.32	56.0°	0.2944	10.62
-87.5°	0.0075	42.50	-51.5°	0.3175	9.97	-15.5°	0.6173	4.19	20.5°	0.4078	7.79	56.5°	0.2896	10.76
-87.0°	0.0090	40.92	-51.0°	0.3192	9.92	-15.0°	0.6381	3.90	21.0°	0.3850	8.29	57.0°	0.2847	10.91
-86.5°	0.0105	39.58	-50.5°	0.3207	9.88	-14.5°	0.6588	3.62	21.5°	0.3621	8.82	57.5°	0.2795	11.07
-86.0°	0.0120	38.42	-50.0°	0.3222	9.84	-14.0°	0.6795	3.36	22.0°	0.3392	9.39	58.0°	0.2742	11.24
-85.5°	0.0140	37.08	-49.5°	0.3227	9.82	-13.5°	0.6992	3.11	22.5°	0.3165	9.99	58.5°	0.2712	11.33
-85.0°	0.0160	35.92	-49.0°	0.3231	9.81	-13.0°	0.7190	2.87	23.0°	0.2938	10.64	59.0°	0.2683	11.43
-84.5°	0.0185	34.66	-48.5°	0.3231	9.81	-12.5°	0.7376	2.64	23.5°	0.2713	11.33	59.5°	0.2595	11.72
-84.0°	0.0210	33.56	-48.0°	0.3232	9.81	-12.0°	0.7563	2.43	24.0°	0.2488	12.08	60.0°	0.2508	12.01
-83.5°	0.0235	32.58	-47.5°	0.3221	9.84	-11.5°	0.7742	2.22	24.5°	0.2267	12.89	60.5°	0.2458	12.19
-83.0°	0.0260	31.70	-47.0°	0.3211	9.87	-11.0°	0.7920	2.03	25.0°	0.2046	13.78	61.0°	0.2408	12.37
-82.5°	0.0285	30.91	-46.5°	0.3195	9.91	-10.5°	0.8086	1.85	25.5°	0.1830	14.75	61.5°	0.2346	12.59
-82.0°	0.0310	30.18	-46.0°	0.3180	9.95	-10.0°	0.8251	1.67	26.0°	0.1614	15.84	62.0°	0.2285	12.82
-81.5°	0.0345	29.25	-45.5°	0.3156	10.02	-9.5°	0.8407	1.51	26.5°	0.1403	17.06	62.5°	0.2220	13.07
-81.0°	0.0380	28.41	-45.0°	0.3131	10.09	-9.0°	0.8562	1.35	27.0°	0.1192	18.48	63.0°	0.2156	13.33
-80.5°	0.0410	27.75	-44.5°	0.3095	10.19	-8.5°	0.8703	1.21	27.5°	0.0987	20.11	63.5°	0.2094	13.58
-80.0°	0.0439	27.14	-44.0°	0.3060	10.29	-8.0°	0.8843	1.07	28.0°	0.0783	22.13	64.0°	0.2031	13.84
-79.5°	0.0479	26.39	-43.5°	0.3017	10.41	-7.5°	0.8972	0.94	28.5°	0.0583	24.68	64.5°	0.1972	14.10
-79.0°	0.0519	25.70	-43.0°	0.2975	10.53	-7.0°	0.9101	0.82	29.0°	0.0384	28.31	65.0°	0.1913	14.37
-78.5°	0.0559	25.06	-42.5°	0.2923	10.68	-6.5°	0.9213	0.71	29.5°	0.0196	34.15	65.5°	0.1847	14.67
-78.0°	0.0598	24.46	-42.0°	0.2871	10.84	-6.0°	0.9324	0.61	30.0°	0.0008	61.87	66.0°	0.1781	14.99
-77.5°	0.0638	23.90	-41.5°	0.2807	11.04	-5.5°	0.9423	0.52	30.5°	0.0181	34.86	66.5°	0.1719	15.30
-77.0°	0.0678	23.38	-41.0°	0.2743	11.24	-5.0°	0.9522	0.43	31.0°	0.0354	29.03	67.0°	0.1656	15.62
-76.5°	0.0722	22.83	-40.5°	0.2669	11.47	-4.5°	0.9603	0.35	31.5°	0.0524	25.61	67.5°	0.1597	15.93
-76.0°	0.0767	22.31	-40.0°	0.2595	11.72	-4.0°	0.9683	0.28	32.0°	0.0695	23.16	68.0°	0.1538	16.26
-75.5°	0.0811	21.82	-39.5°	0.2513	12.00	-3.5°	0.9750	0.22	32.5°	0.0858	21.33	68.5°	0.1478	16.61
-75.0°	0.0855	21.36	-39.0°	0.2431	12.28	-3.0°	0.9816	0.16	33.0°	0.1021	19.82	69.0°	0.1418	16.97
-74.5°	0.0904	20.88	-38.5°	0.2337	12.63	-2.5°	0.9863	0.12	33.5°	0.1173	18.62	69.5°	0.1357	17.35
-74.0°	0.0953	20.42	-38.0°	0.2242	12.99	-2.0°	0.9910	0.08	34.0°	0.1325	17.56	70.0°	0.1296	17.75
-73.5°	0.1001	19.99	-37.5°	0.2138	13.40	-1.5°	0.9938	0.05	34.5°	0.1466	16.68	70.5°	0.1239	18.14
-73.0°	0.1050	19.58	-37.0°	0.2033	13.84	-1.0°	0.9965	0.03	35.0°	0.1607	15.88	71.0°	0.1182	18.55
-72.5°	0.1103	19.15	-36.5°	0.1917	14.35	-0.5°	0.9983	0.02	35.5°	0.1737	15.20	71.5°	0.1124	18.98
-72.0°	0.1156	18.74	-36.0°	0.1800	14.89	0.0°	1.0000	0.00	36.0°	0.1868	14.57	72.0°	0.1067	19.44
-71.5°	0.1208	18.36	-35.5°	0.1675	15.52	0.5°	0.9992	0.01	36.5°	0.1988	14.03	72.5°	0.1014	19.88
-71.0°	0.1261	17.99	-35.0°	0.1550	16.19	1.0°	0.9985	0.01	37.0°	0.2108	13.52	73.0°	0.0961	20.35
-70.5°	0.1313	17.64	-34.5°	0.1413	16.99	1.5°	0.9958	0.04	37.5°	0.2218	13.08	73.5°	0.0912	20.80
-70.0°	0.1365	17.30	-34.0°	0.1277	17.88	2.0°	0.9930	0.06	38.0°	0.2327	12.66	74.0°	0.0863	21.28
-69.5°	0.1421	16.95	-33.5°	0.1131	18.93	2.5°	0.9893	0.09	38.5°	0.2424	12.31	74.5°	0.0814	21.78
-69.0°	0.1477	16.61	-33.0°	0.0984	20.14	3.0°	0.9855	0.13	39.0°	0.2522	11.97	75.0°	0.0765	22.32
-68.5°	0.1537	16.27	-32.5°	0.0828	21.63	3.5°	0.9794	0.18	39.5°	0.2608	11.67	75.5°	0.0716	22.90
-68.0°	0.1597	15.94	-32.0°	0.0673	23.45	4.0°	0.9732	0.24	40.0°	0.2694	11.39	76.0°	0.0667	23.52
-67.5°	0.1651	15.65	-31.5°	0.0507	25.90	4.5°	0.9661	0.30	40.5°	0.2770	11.15	76.5°	0.0622	24.12
-67.0°	0.1705	15.37	-31.0°	0.0342	29.33	5.0°	0.9589	0.36	41.0°	0.2846	10.91	77.0°	0.0578	24.76
-66.5°	0.1767	15.06	-30.5°	0.0175	35.15	5.5°	0.9495	0.45	41.5°	0.2912	10.72	77.5°	0.0538	25.38
-66.0°	0.1829	14.75	-30.0°	0.0008	62.11	6.0°	0.9400	0.54	42.0°	0.2977	10.52	78.0°	0.0499	26.04
-65.5°	0.1885	14.49	-29.5°	0.0191	34.38	6.5°	0.9292	0.64	42.5°	0.3033	10.36	78.5°	0.0459	26.76
-65.0°	0.1942	14.24	-29.0°	0.0374	28.54	7.0°	0.9184	0.74	43.0°	0.3088	10.21	79.0°	0.0419	27.55
-64.5°	0.2001	13.98	-28.5°	0.0565	24.95	7.5°	0.9063	0.85	43.5°	0.3131	10.09	79.5°	0.0384	28.30
-64.0°	0.2060	13.72	-28.0°	0.0756	22.42	8.0°	0.8943	0.97	44.0°	0.3174	9.97	80.0°	0.0350	29.13
-63.5°	0.2117	13.48	-27.5°	0.0955	20.40	8.5°	0.8805	1.11	44.5°	0.3207	9.88	80.5°	0.0320	29.91
-63.0°	0.2174	13.25	-27.0°	0.1154	18.76	9.0°	0.8668	1.24	45.0°	0.3240	9.79	81.0°	0.0290	30.76
-62.5°	0.2230	13.04	-26.5°	0.1359	17.34	9.5°	0.8515	1.40	45.5°	0.3267	9.72	81.5°	0.0260	31.71
-62.0°	0.2285	12.82	-26.0°	0.1564	16.12	10.0°	0.8362	1.55	46.0°	0.3294	9.65	82.0°	0.0230	32.77
-61.5°	0.2342	12.61	-25.5°	0.1775	15.02	10.5°	0.8199	1.72	46.5°	0.3309	9.61	82.5°	0.0205	33.77
-61.0°	0.2399	12.40	-25.0°	0.1986	14.04	11.0°	0.8036	1.90	47.0°	0.3323	9.57	83.0°	0.0180	34.90
-60.5°	0.2454	12.20	-24.5°	0.2201	13.15	11.5°	0.7859	2.09	47.5°	0.3330	9.55	83.5°	0.0160	35.92
-60.0°	0.2508	12.01	-24.0°	0.2416	12.34	12.0°	0.7682	2.29	48.0°	0.3336	9.54	84.0°	0.0140	37.08
-59.5°	0.2559	11.84	-23.5°	0.2635	11.59	12.5°	0.7497	2.50	48.5°	0.3337	9.53	84.5°	0.0120	38.42
-59.0°	0.2611	11.66	-23.0°	0.2854	10.89	13.0°	0.7311	2.72	49.0°	0.3338	9.53	85.0°	0.0100	40.00
-58.5°	0.2659	11.51	-22.5°	0.3077	10.24	13.5°	0.7100	2.97	49.5°	0.3329	9.55	85.5°	0.0085	41.41
-58.0°	0.2707	11.35	-22.0°	0.3299	9.63	14.0°	0.6889	3.24	50.0°	0.3319	9.58	86.0°	0.0070	43.10
-57.5°	0.2755	11.20	-21.5°	0.3523	9.06	14.5°	0.6694	3.49	50.5°	0.3301	9.63	86.5°	0.0060	44.44
-57.0°	0.2804	11.05	-21.0°	0.3746	8.53	15.0°	0.6498	3.74	51.0°	0.3284	9.67	87.0°	0.0050	46.02
-56.5°	0.2848	10.91	-20.5°	0.3971	8.02	15.5°	0.6280	4.04	51.5°	0.3264	9.73	87.5°	0.0040	47.96
-56.0°	0.2893	10.77	-20.0°	0.4196	7.54	16.0°	0.6062	4.35	52.0°	0.3243	9.78	88.0°	0.0030	50.46
-55.5°	0.2932	10.66	-19.5°	0.4421	7.09	16.5°	0.5856	4.65	52.5°	0.3213	9.86	88.5°	0.0025	52.04
-55.0°	0.2972	10.54	-19.0°	0.4647	6.66	17.0°	0.5650	4.96	53.0°	0.3182	9.95	89.0°	0.0020	53.98
-54.5°	0.3007	10.44	-18.5°	0.4870	6.25	17.5°	0.5430	5.30	53.5°	0.3149	10.04	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

3

ÂNGULO DE MEIA POTÊNCIA VERTICAL

17.60°

GANHO

2.18 dBd

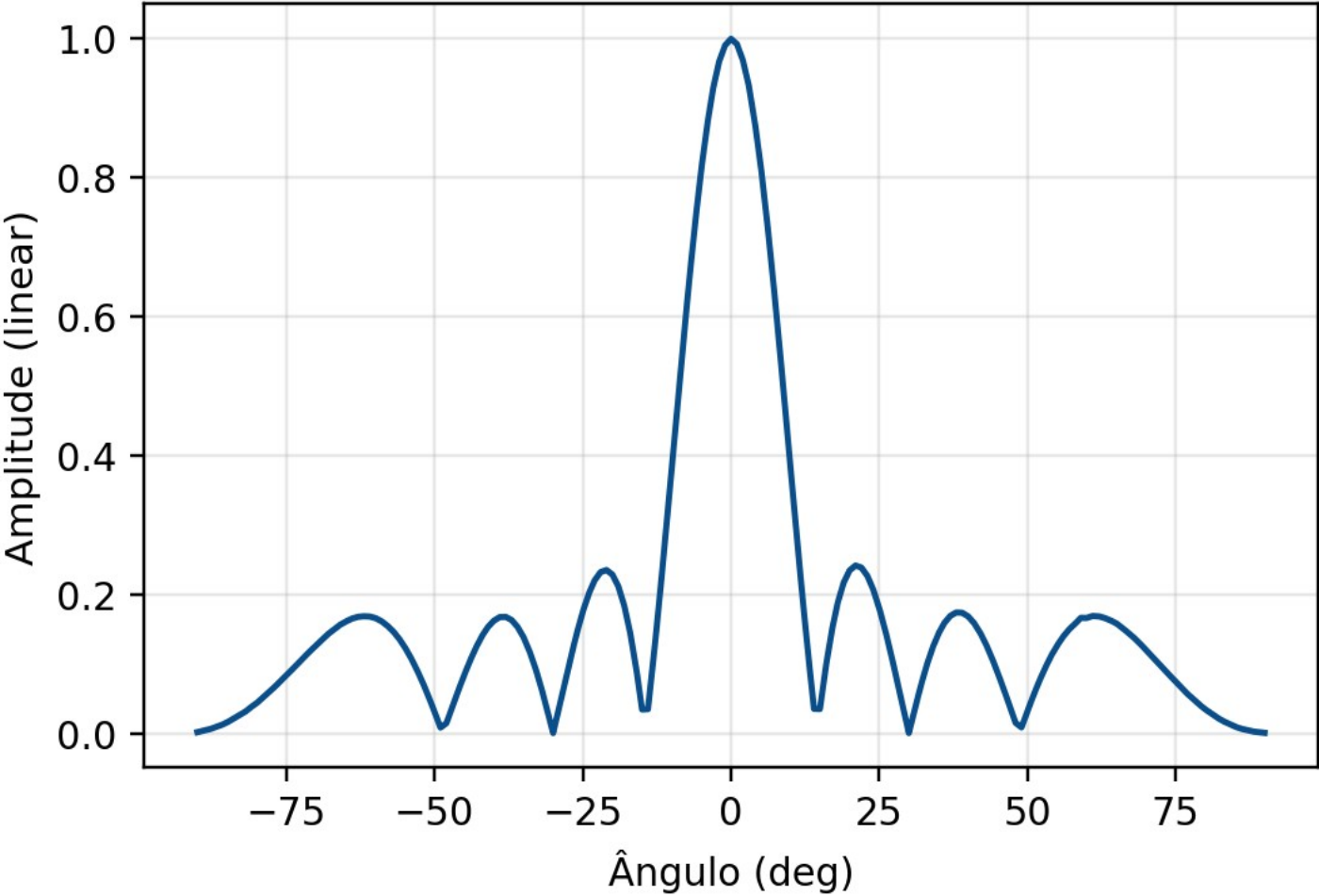
PRIMEIRO NULO

19.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.2114	13.50	-18.0°	0.0834	21.58	18.0°	0.0853	21.38	54.0°	0.2165	13.29
-89.5°	0.0030	50.46	-53.5°	0.2081	13.64	-17.5°	0.1140	18.86	18.5°	0.0561	25.03	54.5°	0.2184	13.21
-89.0°	0.0040	47.96	-53.0°	0.2047	13.78	-17.0°	0.1446	16.80	19.0°	0.0268	31.44	55.0°	0.2203	13.14
-88.5°	0.0050	46.02	-52.5°	0.2006	13.95	-16.5°	0.1768	15.05	19.5°	0.0270	31.36	55.5°	0.2214	13.09
-88.0°	0.0060	44.44	-52.0°	0.1965	14.13	-16.0°	0.2090	13.60	20.0°	0.0273	31.28	56.0°	0.2226	13.05
-87.5°	0.0075	42.50	-51.5°	0.1911	14.37	-15.5°	0.2424	12.31	20.5°	0.0518	25.71	56.5°	0.2228	13.04
-87.0°	0.0090	40.92	-51.0°	0.1857	14.62	-15.0°	0.2757	11.19	21.0°	0.0764	22.34	57.0°	0.2229	13.04
-86.5°	0.0105	39.58	-50.5°	0.1795	14.92	-14.5°	0.3102	10.17	21.5°	0.0982	20.15	57.5°	0.2222	13.07
-86.0°	0.0120	38.42	-50.0°	0.1733	15.23	-14.0°	0.3447	9.25	22.0°	0.1201	18.41	58.0°	0.2214	13.09
-85.5°	0.0140	37.08	-49.5°	0.1658	15.61	-13.5°	0.3795	8.42	22.5°	0.1391	17.13	58.5°	0.2221	13.07
-85.0°	0.0160	35.92	-49.0°	0.1583	16.01	-13.0°	0.4143	7.65	23.0°	0.1582	16.02	59.0°	0.2227	13.05
-84.5°	0.0185	34.66	-48.5°	0.1499	16.48	-12.5°	0.4490	6.95	23.5°	0.1742	15.18	59.5°	0.2180	13.23
-84.0°	0.0210	33.56	-48.0°	0.1416	16.98	-12.0°	0.4837	6.31	24.0°	0.1903	14.41	60.0°	0.2133	13.42
-83.5°	0.0235	32.58	-47.5°	0.1321	17.58	-11.5°	0.5181	5.71	24.5°	0.2033	13.84	60.5°	0.2113	13.50
-83.0°	0.0260	31.71	-47.0°	0.1226	18.23	-11.0°	0.5525	5.15	25.0°	0.2164	13.29	61.0°	0.2093	13.58
-82.5°	0.0285	30.91	-46.5°	0.1124	18.99	-10.5°	0.5857	4.65	25.5°	0.2266	12.90	61.5°	0.2058	13.73
-82.0°	0.0310	30.19	-46.0°	0.1021	19.82	-10.0°	0.6190	4.17	26.0°	0.2367	12.51	62.0°	0.2024	13.88
-81.5°	0.0344	29.26	-45.5°	0.0909	20.83	-9.5°	0.6510	3.73	26.5°	0.2438	12.26	62.5°	0.1983	14.05
-81.0°	0.0379	28.42	-45.0°	0.0797	21.97	-9.0°	0.6830	3.31	27.0°	0.2510	12.01	63.0°	0.1942	14.23
-80.5°	0.0409	27.77	-44.5°	0.0677	23.38	-8.5°	0.7130	2.94	27.5°	0.2553	11.86	63.5°	0.1900	14.42
-80.0°	0.0439	27.16	-44.0°	0.0557	25.08	-8.0°	0.7430	2.58	28.0°	0.2596	11.71	64.0°	0.1858	14.62
-79.5°	0.0478	26.41	-43.5°	0.0431	27.31	-7.5°	0.7708	2.26	28.5°	0.2600	11.70	64.5°	0.1815	14.82
-79.0°	0.0518	25.72	-43.0°	0.0305	30.31	-7.0°	0.7987	1.95	29.0°	0.2605	11.68	65.0°	0.1773	15.03
-78.5°	0.0557	25.09	-42.5°	0.0173	35.22	-6.5°	0.8236	1.69	29.5°	0.2594	11.72	65.5°	0.1721	15.28
-78.0°	0.0596	24.49	-42.0°	0.0042	47.58	-6.0°	0.8486	1.43	30.0°	0.2583	11.76	66.0°	0.1670	15.55
-77.5°	0.0635	23.95	-41.5°	0.0135	37.37	-5.5°	0.8706	1.20	30.5°	0.2557	11.84	66.5°	0.1619	15.81
-77.0°	0.0674	23.43	-41.0°	0.0229	32.80	-5.0°	0.8927	0.99	31.0°	0.2532	11.93	67.0°	0.1569	16.09
-76.5°	0.0717	22.89	-40.5°	0.0366	28.72	-4.5°	0.9111	0.81	31.5°	0.2471	12.14	67.5°	0.1519	16.37
-76.0°	0.0761	22.38	-40.0°	0.0504	25.96	-4.0°	0.9296	0.63	32.0°	0.2411	12.36	68.0°	0.1470	16.65
-75.5°	0.0804	21.90	-39.5°	0.0642	23.85	-3.5°	0.9445	0.50	32.5°	0.2338	12.62	68.5°	0.1418	16.97
-75.0°	0.0846	21.45	-39.0°	0.0780	22.16	-3.0°	0.9595	0.36	33.0°	0.2265	12.90	69.0°	0.1366	17.29
-74.5°	0.0893	20.98	-38.5°	0.0915	20.77	-2.5°	0.9703	0.26	33.5°	0.2172	13.26	69.5°	0.1311	17.65
-74.0°	0.0941	20.53	-38.0°	0.1051	19.57	-2.0°	0.9811	0.17	34.0°	0.2079	13.64	70.0°	0.1256	18.02
-73.5°	0.0987	20.12	-37.5°	0.1183	18.54	-1.5°	0.9876	0.11	34.5°	0.1970	14.11	70.5°	0.1204	18.38
-73.0°	0.1033	19.72	-37.0°	0.1314	17.63	-1.0°	0.9940	0.05	35.0°	0.1862	14.60	71.0°	0.1153	18.77
-72.5°	0.1083	19.31	-36.5°	0.1438	16.84	-0.5°	0.9970	0.03	35.5°	0.1742	15.18	71.5°	0.1099	19.18
-72.0°	0.1132	18.92	-36.0°	0.1563	16.12	0.0°	1.0000	0.00	36.0°	0.1621	15.80	72.0°	0.1045	19.61
-71.5°	0.1181	18.56	-35.5°	0.1679	15.50	0.5°	0.9980	0.02	36.5°	0.1492	16.52	72.5°	0.0995	20.04
-71.0°	0.1229	18.21	-35.0°	0.1796	14.92	1.0°	0.9960	0.03	37.0°	0.1363	17.31	73.0°	0.0945	20.49
-70.5°	0.1276	17.88	-34.5°	0.1900	14.43	1.5°	0.9895	0.09	37.5°	0.1227	18.22	73.5°	0.0899	20.93
-70.0°	0.1323	17.57	-34.0°	0.2004	13.96	2.0°	0.9831	0.15	38.0°	0.1091	19.24	74.0°	0.0852	21.39
-69.5°	0.1372	17.25	-33.5°	0.2094	13.58	2.5°	0.9732	0.24	38.5°	0.0950	20.45	74.5°	0.0805	21.88
-69.0°	0.1422	16.94	-33.0°	0.2185	13.21	3.0°	0.9634	0.32	39.0°	0.0809	21.84	75.0°	0.0758	22.41
-68.5°	0.1474	16.63	-32.5°	0.2259	12.92	3.5°	0.9488	0.46	39.5°	0.0666	23.53	75.5°	0.0710	22.98
-68.0°	0.1526	16.33	-32.0°	0.2334	12.64	4.0°	0.9343	0.59	40.0°	0.0523	25.63	76.0°	0.0662	23.58
-67.5°	0.1570	16.08	-31.5°	0.2390	12.43	4.5°	0.9166	0.76	40.5°	0.0380	28.40	76.5°	0.0618	24.18
-67.0°	0.1615	15.84	-31.0°	0.2446	12.23	5.0°	0.8990	0.92	41.0°	0.0238	32.48	77.0°	0.0575	24.81
-66.5°	0.1665	15.57	-30.5°	0.2479	12.11	5.5°	0.8772	1.14	41.5°	0.0141	37.05	77.5°	0.0536	25.42
-66.0°	0.1715	15.31	-30.0°	0.2513	12.00	6.0°	0.8555	1.36	42.0°	0.0043	47.26	78.0°	0.0497	26.08
-65.5°	0.1757	15.10	-29.5°	0.2525	11.96	6.5°	0.8307	1.61	42.5°	0.0180	34.90	78.5°	0.0457	26.80
-65.0°	0.1799	14.90	-29.0°	0.2536	11.92	7.0°	0.8060	1.87	43.0°	0.0317	29.99	79.0°	0.0418	27.58
-64.5°	0.1842	14.70	-28.5°	0.2522	11.96	7.5°	0.7787	2.17	43.5°	0.0447	26.99	79.5°	0.0383	28.33
-64.0°	0.1884	14.50	-28.0°	0.2509	12.01	8.0°	0.7513	2.48	44.0°	0.0578	24.76	80.0°	0.0349	29.15
-63.5°	0.1922	14.33	-27.5°	0.2470	12.15	8.5°	0.7214	2.84	44.5°	0.0702	23.08	80.5°	0.0319	29.92
-63.0°	0.1959	14.16	-27.0°	0.2430	12.29	9.0°	0.6915	3.20	45.0°	0.0825	21.67	81.0°	0.0289	30.77
-62.5°	0.1991	14.02	-26.5°	0.2362	12.53	9.5°	0.6594	3.62	45.5°	0.0941	20.53	81.5°	0.0260	31.72
-62.0°	0.2024	13.88	-26.0°	0.2294	12.79	10.0°	0.6273	4.05	46.0°	0.1057	19.52	82.0°	0.0230	32.78
-61.5°	0.2054	13.75	-25.5°	0.2197	13.16	10.5°	0.5939	4.53	46.5°	0.1163	18.69	82.5°	0.0205	33.78
-61.0°	0.2085	13.62	-25.0°	0.2100	13.55	11.0°	0.5605	5.03	47.0°	0.1270	17.93	83.0°	0.0180	34.90
-60.5°	0.2109	13.52	-24.5°	0.1974	14.09	11.5°	0.5260	5.58	47.5°	0.1365	17.29	83.5°	0.0160	35.92
-60.0°	0.2133	13.42	-24.0°	0.1847	14.67	12.0°	0.4914	6.17	48.0°	0.1461	16.70	84.0°	0.0140	37.08
-59.5°	0.2150	13.35	-23.5°	0.1692	15.43	12.5°	0.4564	6.81	48.5°	0.1548	16.20	84.5°	0.0120	38.42
-59.0°	0.2167	13.28	-23.0°	0.1536	16.27	13.0°	0.4213	7.51	49.0°	0.1635	15.73	85.0°	0.0100	40.00
-58.5°	0.2176	13.25	-22.5°	0.1352	17.38	13.5°	0.3854	8.28	49.5°	0.1710	15.34	85.5°	0.0085	41.41
-58.0°	0.2186	13.21	-22.0°	0.1168	18.65	14.0°	0.3494	9.13	50.0°	0.1784	14.97	86.0°	0.0070	43.10
-57.5°	0.2190	13.19	-21.5°	0.0956	20.39	14.5°	0.3151	10.03	50.5°	0.1848	14.67	86.5°	0.0060	44.44
-57.0°	0.2195	13.17	-21.0°	0.0743	22.57	15.0°	0.2808	11.03	51.0°	0.1911	14.38	87.0°	0.0050	46.02
-56.5°	0.2191	13.19	-20.5°	0.0505	25.94	15.5°	0.2466	12.16	51.5°	0.1965	14.13	87.5°	0.0040	47.96
-56.0°	0.2187	13.20	-20.0°	0.0266	31.51	16.0°	0.2124	13.46	52.0°	0.2019	13.90	88.0°	0.0030	50.46
-55.5°	0.2173	13.26	-19.5°	0.0264	31.58	16.5°	0.1800	14.89	52.5°	0.2060	13.72	88.5°	0.0025	52.04
-55.0°	0.2160	13.31	-19.0°	0.0262	31.65	17.0°	0.1476	16.62	53.0°	0.2101	13.55	89.0°	0.0020	53.98
-54.5°	0.2137	13.40	-18.5°	0.0548	25.23	17.5°	0.1165	18.68	53.5°	0.2133	13.42	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

4

ÂNGULO DE MEIA POTÊNCIA VERTICAL

13.38°

GANHO

3.47 dBd

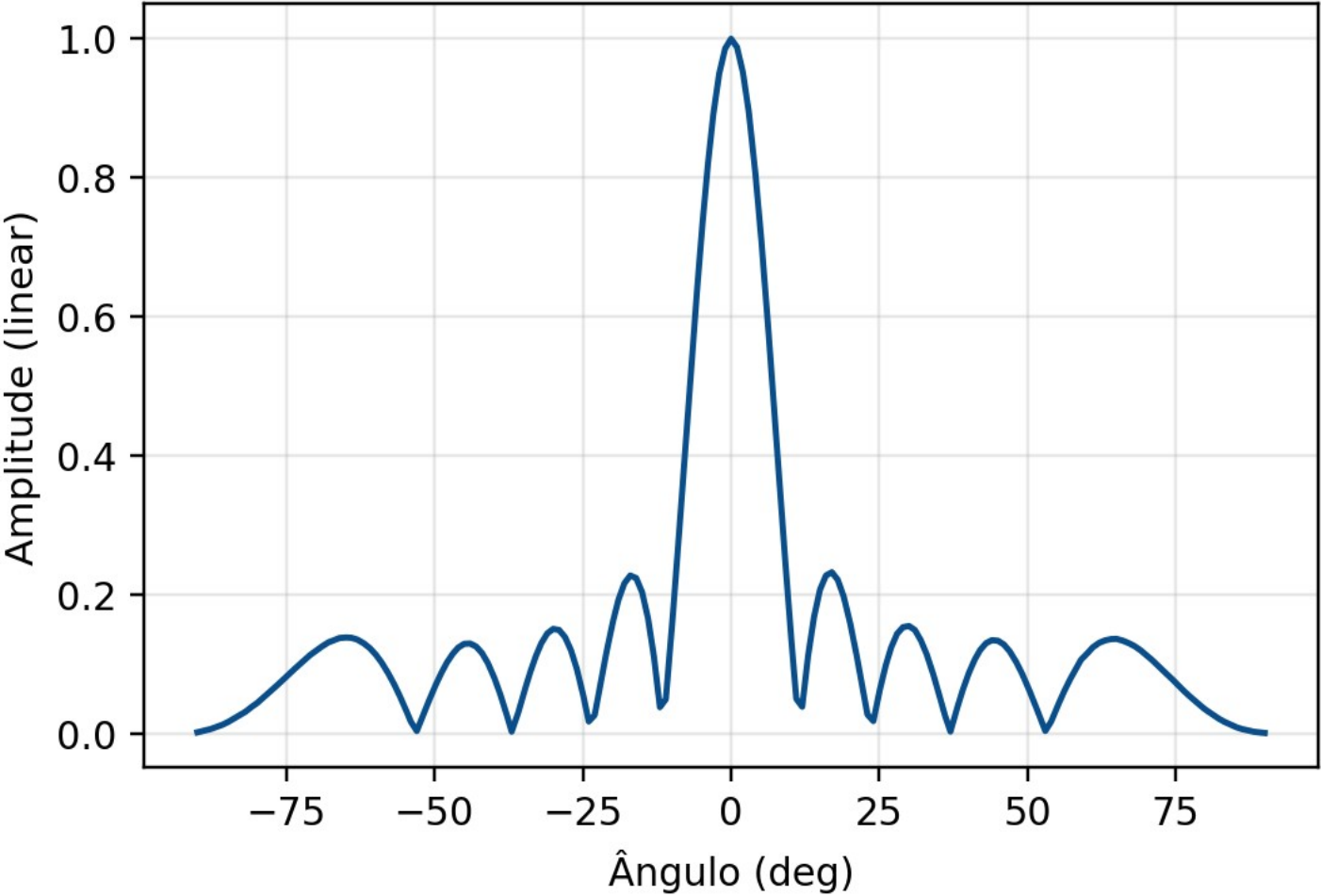
PRIMEIRO NULO

14.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.1093	19.23	-18.0°	0.1839	14.71	18.0°	0.1882	14.51	54.0°	0.1119	19.02
-89.5°	0.0030	50.46	-53.5°	0.1008	19.93	-17.5°	0.1644	15.68	18.5°	0.2027	13.86	54.5°	0.1193	18.47
-89.0°	0.0040	47.96	-53.0°	0.0923	20.69	-17.0°	0.1450	16.78	19.0°	0.2171	13.27	55.0°	0.1267	17.95
-88.5°	0.0050	46.02	-52.5°	0.0830	21.62	-16.5°	0.1200	18.42	19.5°	0.2260	12.92	55.5°	0.1330	17.52
-88.0°	0.0060	44.44	-52.0°	0.0737	22.65	-16.0°	0.0950	20.45	20.0°	0.2348	12.59	56.0°	0.1394	17.12
-87.5°	0.0075	42.50	-51.5°	0.0634	23.96	-15.5°	0.0648	23.77	20.5°	0.2383	12.46	56.5°	0.1445	16.80
-87.0°	0.0090	40.92	-51.0°	0.0532	25.49	-15.0°	0.0347	29.20	21.0°	0.2419	12.33	57.0°	0.1497	16.49
-86.5°	0.0105	39.58	-50.5°	0.0423	27.48	-14.5°	0.0349	29.14	21.5°	0.2404	12.38	57.5°	0.1537	16.27
-86.0°	0.0120	38.42	-50.0°	0.0314	30.06	-14.0°	0.0352	29.08	22.0°	0.2389	12.44	58.0°	0.1577	16.05
-85.5°	0.0140	37.08	-49.5°	0.0200	33.99	-13.5°	0.0743	22.59	22.5°	0.2329	12.66	58.5°	0.1621	15.80
-85.0°	0.0160	35.92	-49.0°	0.0085	41.37	-13.0°	0.1134	18.91	23.0°	0.2270	12.88	59.0°	0.1665	15.57
-84.5°	0.0185	34.66	-48.5°	0.0117	38.61	-12.5°	0.1558	16.15	23.5°	0.2170	13.27	59.5°	0.1665	15.57
-84.0°	0.0210	33.56	-48.0°	0.0149	36.53	-12.0°	0.1983	14.05	24.0°	0.2071	13.68	60.0°	0.1664	15.58
-83.5°	0.0235	32.59	-47.5°	0.0267	31.47	-11.5°	0.2434	12.28	24.5°	0.1939	14.25	60.5°	0.1678	15.50
-83.0°	0.0260	31.71	-47.0°	0.0385	28.29	-11.0°	0.2884	10.80	25.0°	0.1807	14.86	61.0°	0.1693	15.43
-82.5°	0.0284	30.92	-46.5°	0.0502	25.99	-10.5°	0.3349	9.50	25.5°	0.1650	15.65	61.5°	0.1691	15.44
-82.0°	0.0309	30.20	-46.0°	0.0618	24.18	-10.0°	0.3814	8.37	26.0°	0.1493	16.52	62.0°	0.1688	15.45
-81.5°	0.0344	29.27	-45.5°	0.0730	22.73	-9.5°	0.4283	7.36	26.5°	0.1318	17.60	62.5°	0.1676	15.51
-81.0°	0.0378	28.44	-45.0°	0.0843	21.49	-9.0°	0.4753	6.46	27.0°	0.1142	18.85	63.0°	0.1665	15.57
-80.5°	0.0408	27.79	-44.5°	0.0947	20.48	-8.5°	0.5215	5.66	27.5°	0.0955	20.40	63.5°	0.1647	15.67
-80.0°	0.0437	27.18	-44.0°	0.1051	19.57	-8.0°	0.5676	4.92	28.0°	0.0768	22.29	64.0°	0.1630	15.76
-79.5°	0.0476	26.44	-43.5°	0.1146	18.82	-7.5°	0.6120	4.27	28.5°	0.0575	24.80	64.5°	0.1608	15.87
-79.0°	0.0515	25.76	-43.0°	0.1240	18.13	-7.0°	0.6564	3.66	29.0°	0.0383	28.35	65.0°	0.1587	15.99
-78.5°	0.0554	25.13	-42.5°	0.1322	17.57	-6.5°	0.6975	3.13	29.5°	0.0195	34.19	65.5°	0.1554	16.17
-78.0°	0.0593	24.55	-42.0°	0.1404	17.05	-6.0°	0.7387	2.63	30.0°	0.0008	61.87	66.0°	0.1521	16.36
-77.5°	0.0631	24.01	-41.5°	0.1468	16.66	-5.5°	0.7759	2.20	30.5°	0.0180	34.89	66.5°	0.1486	16.56
-77.0°	0.0668	23.50	-41.0°	0.1533	16.29	-5.0°	0.8131	1.80	31.0°	0.0352	29.07	67.0°	0.1451	16.77
-76.5°	0.0711	22.97	-40.5°	0.1578	16.04	-4.5°	0.8450	1.46	31.5°	0.0517	25.72	67.5°	0.1414	16.99
-76.0°	0.0753	22.47	-40.0°	0.1624	15.79	-4.0°	0.8769	1.14	32.0°	0.0683	23.31	68.0°	0.1377	17.22
-75.5°	0.0794	22.01	-39.5°	0.1650	15.65	-3.5°	0.9030	0.89	32.5°	0.0832	21.60	68.5°	0.1336	17.49
-75.0°	0.0835	21.57	-39.0°	0.1676	15.51	-3.0°	0.9291	0.64	33.0°	0.0981	20.16	69.0°	0.1294	17.76
-74.5°	0.0879	21.12	-38.5°	0.1678	15.50	-2.5°	0.9482	0.46	33.5°	0.1108	19.11	69.5°	0.1248	18.08
-74.0°	0.0924	20.69	-38.0°	0.1680	15.50	-2.0°	0.9673	0.29	34.0°	0.1235	18.16	70.0°	0.1202	18.40
-73.5°	0.0966	20.30	-37.5°	0.1657	15.61	-1.5°	0.9789	0.19	34.5°	0.1338	17.47	70.5°	0.1157	18.73
-73.0°	0.1009	19.92	-37.0°	0.1634	15.73	-1.0°	0.9905	0.08	35.0°	0.1440	16.83	71.0°	0.1112	19.08
-72.5°	0.1055	19.54	-36.5°	0.1585	16.00	-0.5°	0.9953	0.04	35.5°	0.1517	16.38	71.5°	0.1064	19.46
-72.0°	0.1100	19.17	-36.0°	0.1536	16.27	0.0°	1.0000	0.00	36.0°	0.1593	15.95	72.0°	0.1016	19.87
-71.5°	0.1143	18.84	-35.5°	0.1462	16.70	0.5°	0.9963	0.03	36.5°	0.1644	15.68	72.5°	0.0970	20.27
-71.0°	0.1186	18.52	-35.0°	0.1389	17.15	1.0°	0.9925	0.07	37.0°	0.1694	15.42	73.0°	0.0924	20.69
-70.5°	0.1226	18.23	-34.5°	0.1290	17.79	1.5°	0.9809	0.17	37.5°	0.1719	15.30	73.5°	0.0880	21.11
-70.0°	0.1266	17.95	-34.0°	0.1191	18.48	2.0°	0.9693	0.27	38.0°	0.1743	15.17	74.0°	0.0837	21.54
-69.5°	0.1307	17.68	-33.5°	0.1069	19.42	2.5°	0.9510	0.44	38.5°	0.1741	15.18	74.5°	0.0792	22.02
-69.0°	0.1348	17.41	-33.0°	0.0947	20.48	3.0°	0.9328	0.60	39.0°	0.1739	15.20	75.0°	0.0747	22.53
-68.5°	0.1389	17.15	-32.5°	0.0804	21.90	3.5°	0.9071	0.85	39.5°	0.1713	15.33	75.5°	0.0701	23.08
-68.0°	0.1430	16.90	-32.0°	0.0661	23.60	4.0°	0.8813	1.10	40.0°	0.1686	15.46	76.0°	0.0655	23.68
-67.5°	0.1461	16.70	-31.5°	0.0501	26.01	4.5°	0.8501	1.41	40.5°	0.1638	15.71	76.5°	0.0613	24.26
-67.0°	0.1493	16.52	-31.0°	0.0340	29.37	5.0°	0.8189	1.74	41.0°	0.1591	15.97	77.0°	0.0570	24.88
-66.5°	0.1528	16.32	-30.5°	0.0174	35.19	5.5°	0.7818	2.14	41.5°	0.1523	16.35	77.5°	0.0532	25.48
-66.0°	0.1562	16.12	-30.0°	0.0008	62.11	6.0°	0.7447	2.56	42.0°	0.1456	16.74	78.0°	0.0494	26.13
-65.5°	0.1587	15.99	-29.5°	0.0190	34.42	6.5°	0.7035	3.05	42.5°	0.1372	17.25	78.5°	0.0455	26.84
-65.0°	0.1611	15.86	-29.0°	0.0372	28.58	7.0°	0.6624	3.58	43.0°	0.1288	17.80	79.0°	0.0416	27.61
-64.5°	0.1632	15.75	-28.5°	0.0557	25.08	7.5°	0.6182	4.18	43.5°	0.1189	18.50	79.5°	0.0382	28.36
-64.0°	0.1653	15.64	-28.0°	0.0742	22.59	8.0°	0.5740	4.82	44.0°	0.1090	19.25	80.0°	0.0348	29.17
-63.5°	0.1666	15.57	-27.5°	0.0924	20.69	8.5°	0.5276	5.55	44.5°	0.0981	20.17	80.5°	0.0318	29.94
-63.0°	0.1679	15.50	-27.0°	0.1105	19.13	9.0°	0.4812	6.35	45.0°	0.0872	21.19	81.0°	0.0289	30.79
-62.5°	0.1684	15.47	-26.5°	0.1276	17.88	9.5°	0.4339	7.25	45.5°	0.0756	22.43	81.5°	0.0259	31.73
-62.0°	0.1688	15.45	-26.0°	0.1447	16.79	10.0°	0.3865	8.26	46.0°	0.0640	23.87	82.0°	0.0229	32.79
-61.5°	0.1687	15.46	-25.5°	0.1600	15.92	10.5°	0.3396	9.38	46.5°	0.0519	25.69	82.5°	0.0205	33.78
-61.0°	0.1686	15.46	-25.0°	0.1754	15.12	11.0°	0.2926	10.67	47.0°	0.0399	27.99	83.0°	0.0180	34.91
-60.5°	0.1675	15.52	-24.5°	0.1882	14.51	11.5°	0.2470	12.15	47.5°	0.0276	31.17	83.5°	0.0160	35.93
-60.0°	0.1664	15.58	-24.0°	0.2010	13.93	12.0°	0.2014	13.92	48.0°	0.0154	36.25	84.0°	0.0140	37.09
-59.5°	0.1642	15.69	-23.5°	0.2107	13.53	12.5°	0.1584	16.01	48.5°	0.0121	38.34	84.5°	0.0120	38.42
-59.0°	0.1621	15.81	-23.0°	0.2204	13.13	13.0°	0.1153	18.77	49.0°	0.0088	41.08	85.0°	0.0100	40.00
-58.5°	0.1588	15.98	-22.5°	0.2264	12.90	13.5°	0.0755	22.45	49.5°	0.0206	33.73	85.5°	0.0085	41.41
-58.0°	0.1556	16.16	-22.0°	0.2324	12.68	14.0°	0.0356	28.96	50.0°	0.0323	29.80	86.0°	0.0070	43.10
-57.5°	0.1515	16.39	-21.5°	0.2339	12.62	14.5°	0.0355	29.00	50.5°	0.0435	27.23	86.5°	0.0060	44.44
-57.0°	0.1474	16.63	-21.0°	0.2354	12.56	15.0°	0.0353	29.05	51.0°	0.0547	25.24	87.0°	0.0050	46.02
-56.5°	0.1422	16.94	-20.5°	0.2321	12.69	15.5°	0.0659	23.62	51.5°	0.0652	23.72	87.5°	0.0040	47.96
-56.0°	0.1369	17.27	-20.0°	0.2288	12.81	16.0°	0.0965	20.31	52.0°	0.0757	22.42	88.0°	0.0030	50.46
-55.5°	0.1306	17.68	-19.5°	0.2203	13.14	16.5°	0.1223	18.25	52.5°	0.0852	21.39	88.5°	0.0025	52.04
-55.0°	0.1242	18.12	-19.0°	0.2119	13.48	17.0°	0.1480	16.60	53.0°	0.0947	20.47	89.0°	0.0020	53.98
-54.5°	0.1167	18.66	-18.5°	0.1979	14.07	17.5°	0.1681	15.49	53.5°	0.1033	19.72	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

5

ÂNGULO DE MEIA POTÊNCIA VERTICAL

11.09°

GANHO

4.46 dBd

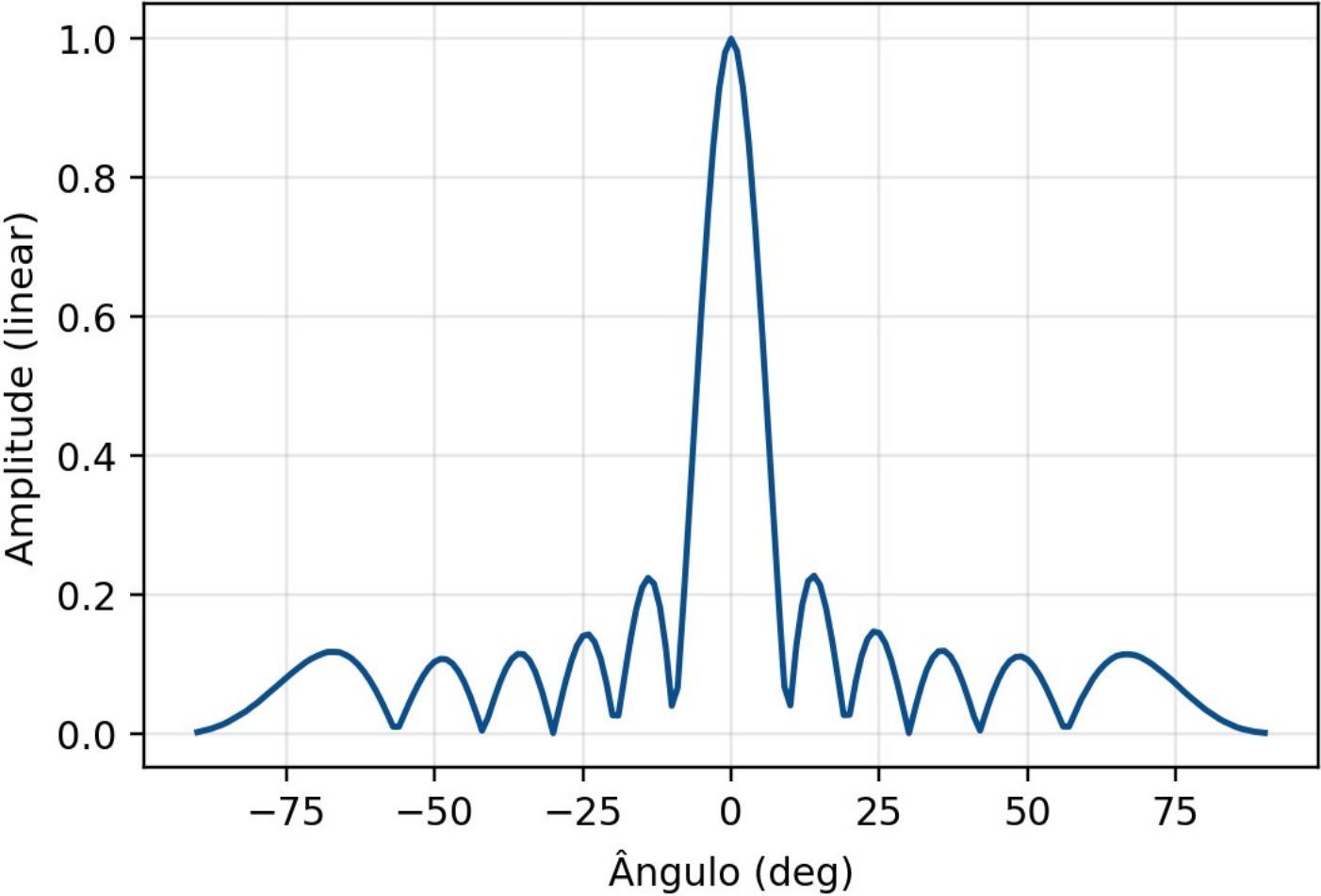
PRIMEIRO NULO

12.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.0173	35.23	-18.0°	0.2163	13.30	18.0°	0.2214	13.10	54.0°	0.0177	35.02
-89.5°	0.0030	50.46	-53.5°	0.0106	39.50	-17.5°	0.2220	13.07	18.5°	0.2093	13.58	54.5°	0.0281	31.03
-89.0°	0.0040	47.96	-53.0°	0.0039	48.26	-17.0°	0.2276	12.85	19.0°	0.1973	14.10	55.0°	0.0385	28.30
-88.5°	0.0050	46.02	-52.5°	0.0146	36.71	-16.5°	0.2258	12.93	19.5°	0.1800	14.89	55.5°	0.0482	26.35
-88.0°	0.0060	44.44	-52.0°	0.0254	31.92	-16.0°	0.2239	13.00	20.0°	0.1628	15.77	56.0°	0.0579	24.75
-87.5°	0.0075	42.50	-51.5°	0.0359	28.89	-15.5°	0.2138	13.40	20.5°	0.1419	16.96	56.5°	0.0667	23.52
-87.0°	0.0090	40.92	-51.0°	0.0465	26.66	-15.0°	0.2036	13.83	21.0°	0.1210	18.34	57.0°	0.0755	22.45
-86.5°	0.0105	39.58	-50.5°	0.0566	24.94	-14.5°	0.1848	14.67	21.5°	0.0979	20.18	57.5°	0.0832	21.60
-86.0°	0.0120	38.42	-50.0°	0.0667	23.51	-14.0°	0.1660	15.60	22.0°	0.0749	22.51	58.0°	0.0910	20.82
-85.5°	0.0140	37.08	-49.5°	0.0760	22.39	-13.5°	0.1383	17.18	22.5°	0.0512	25.81	58.5°	0.0986	20.12
-85.0°	0.0160	35.92	-49.0°	0.0852	21.39	-13.0°	0.1106	19.12	23.0°	0.0276	31.18	59.0°	0.1063	19.47
-84.5°	0.0185	34.67	-48.5°	0.0933	20.60	-12.5°	0.0744	22.57	23.5°	0.0229	32.80	59.5°	0.1105	19.13
-84.0°	0.0210	33.57	-48.0°	0.1014	19.88	-12.0°	0.0382	28.36	24.0°	0.0182	34.80	60.0°	0.1148	18.80
-83.5°	0.0235	32.60	-47.5°	0.1079	19.34	-11.5°	0.0439	27.15	24.5°	0.0391	28.16	60.5°	0.1196	18.45
-83.0°	0.0259	31.72	-47.0°	0.1144	18.83	-11.0°	0.0496	26.09	25.0°	0.0600	24.44	61.0°	0.1243	18.11
-82.5°	0.0284	30.93	-46.5°	0.1192	18.47	-10.5°	0.1000	20.00	25.5°	0.0779	22.17	61.5°	0.1274	17.90
-82.0°	0.0309	30.21	-46.0°	0.1240	18.13	-10.0°	0.1503	16.46	26.0°	0.0959	20.37	62.0°	0.1305	17.69
-81.5°	0.0343	29.29	-45.5°	0.1267	17.95	-9.5°	0.2056	13.74	26.5°	0.1100	19.17	62.5°	0.1323	17.57
-81.0°	0.0377	28.46	-45.0°	0.1293	17.76	-9.0°	0.2608	11.67	27.0°	0.1241	18.12	63.0°	0.1342	17.45
-80.5°	0.0407	27.82	-44.5°	0.1296	17.75	-8.5°	0.3189	9.93	27.5°	0.1340	17.46	63.5°	0.1351	17.39
-80.0°	0.0436	27.22	-44.0°	0.1298	17.74	-8.0°	0.3771	8.47	28.0°	0.1439	16.84	64.0°	0.1361	17.32
-79.5°	0.0474	26.48	-43.5°	0.1276	17.88	-7.5°	0.4361	7.21	28.5°	0.1486	16.56	64.5°	0.1363	17.31
-79.0°	0.0513	25.80	-43.0°	0.1255	18.03	-7.0°	0.4950	6.11	29.0°	0.1533	16.29	65.0°	0.1365	17.30
-78.5°	0.0550	25.19	-42.5°	0.1208	18.36	-6.5°	0.5524	5.16	29.5°	0.1542	16.24	65.5°	0.1353	17.37
-78.0°	0.0588	24.61	-42.0°	0.1161	18.71	-6.0°	0.6097	4.30	30.0°	0.1550	16.19	66.0°	0.1342	17.45
-77.5°	0.0625	24.08	-41.5°	0.1087	19.27	-5.5°	0.6634	3.57	30.5°	0.1521	16.35	66.5°	0.1324	17.56
-77.0°	0.0662	23.59	-41.0°	0.1014	19.88	-5.0°	0.7170	2.89	31.0°	0.1493	16.52	67.0°	0.1307	17.68
-76.5°	0.0702	23.07	-40.5°	0.0918	20.74	-4.5°	0.7644	2.33	31.5°	0.1419	16.96	67.5°	0.1285	17.82
-76.0°	0.0742	22.59	-40.0°	0.0822	21.71	-4.0°	0.8118	1.81	32.0°	0.1345	17.42	68.0°	0.1263	17.97
-75.5°	0.0781	22.15	-39.5°	0.0705	23.03	-3.5°	0.8513	1.40	32.5°	0.1243	18.11	68.5°	0.1234	18.17
-75.0°	0.0820	21.73	-39.0°	0.0589	24.60	-3.0°	0.8908	1.00	33.0°	0.1141	18.85	69.0°	0.1205	18.38
-74.5°	0.0861	21.30	-38.5°	0.0455	26.84	-2.5°	0.9203	0.72	33.5°	0.1013	19.89	69.5°	0.1170	18.64
-74.0°	0.0902	20.89	-38.0°	0.0321	29.86	-2.0°	0.9498	0.45	34.0°	0.0884	21.07	70.0°	0.1134	18.90
-73.5°	0.0941	20.53	-37.5°	0.0176	35.10	-1.5°	0.9679	0.28	34.5°	0.0738	22.64	70.5°	0.1098	19.19
-73.0°	0.0980	20.18	-37.0°	0.0030	50.34	-1.0°	0.9861	0.12	35.0°	0.0592	24.56	71.0°	0.1061	19.49
-72.5°	0.1020	19.83	-36.5°	0.0151	36.43	-0.5°	0.9930	0.06	35.5°	0.0437	27.20	71.5°	0.1020	19.83
-72.0°	0.1060	19.50	-36.0°	0.0271	31.33	0.0°	1.0000	0.00	36.0°	0.0282	31.01	72.0°	0.0978	20.19
-71.5°	0.1096	19.21	-35.5°	0.0421	27.51	0.5°	0.9940	0.05	36.5°	0.0157	36.11	72.5°	0.0937	20.56
-71.0°	0.1132	18.93	-35.0°	0.0571	24.87	1.0°	0.9880	0.10	37.0°	0.0032	50.02	73.0°	0.0896	20.95
-70.5°	0.1163	18.69	-34.5°	0.0712	22.96	1.5°	0.9699	0.27	37.5°	0.0182	34.77	73.5°	0.0857	21.34
-70.0°	0.1195	18.46	-34.0°	0.0852	21.39	2.0°	0.9517	0.43	38.0°	0.0333	29.54	74.0°	0.0818	21.75
-69.5°	0.1225	18.24	-33.5°	0.0976	20.21	2.5°	0.9230	0.70	38.5°	0.0472	26.52	74.5°	0.0776	22.21
-69.0°	0.1255	18.03	-33.0°	0.1101	19.17	3.0°	0.8944	0.97	39.0°	0.0611	24.28	75.0°	0.0734	22.69
-68.5°	0.1283	17.83	-32.5°	0.1201	18.41	3.5°	0.8551	1.36	39.5°	0.0732	22.71	75.5°	0.0690	23.22
-68.0°	0.1311	17.65	-32.0°	0.1302	17.71	4.0°	0.8159	1.77	40.0°	0.0853	21.38	76.0°	0.0646	23.80
-67.5°	0.1328	17.53	-31.5°	0.1372	17.25	4.5°	0.7690	2.28	40.5°	0.0953	20.42	76.5°	0.0605	24.36
-67.0°	0.1345	17.42	-31.0°	0.1442	16.82	5.0°	0.7221	2.83	41.0°	0.1053	19.55	77.0°	0.0564	24.97
-66.5°	0.1362	17.32	-30.5°	0.1475	16.62	5.5°	0.6684	3.50	41.5°	0.1128	18.95	77.5°	0.0527	25.56
-66.0°	0.1378	17.22	-30.0°	0.1508	16.43	6.0°	0.6147	4.23	42.0°	0.1203	18.39	78.0°	0.0490	26.19
-65.5°	0.1382	17.19	-29.5°	0.1500	16.48	6.5°	0.5571	5.08	42.5°	0.1253	18.04	78.5°	0.0452	26.90
-65.0°	0.1385	17.17	-29.0°	0.1492	16.52	7.0°	0.4996	6.03	43.0°	0.1302	17.70	79.0°	0.0414	27.66
-64.5°	0.1383	17.19	-28.5°	0.1441	16.82	7.5°	0.4404	7.12	43.5°	0.1324	17.56	79.5°	0.0380	28.40
-64.0°	0.1380	17.20	-28.0°	0.1391	17.14	8.0°	0.3813	8.37	44.0°	0.1346	17.42	80.0°	0.0347	29.20
-63.5°	0.1367	17.29	-27.5°	0.1296	17.75	8.5°	0.3227	9.82	44.5°	0.1342	17.44	80.5°	0.0317	29.97
-63.0°	0.1353	17.37	-27.0°	0.1202	18.40	9.0°	0.2640	11.57	45.0°	0.1338	17.47	81.0°	0.0288	30.81
-62.5°	0.1329	17.53	-26.5°	0.1065	19.45	9.5°	0.2082	13.63	45.5°	0.1312	17.64	81.5°	0.0259	31.75
-62.0°	0.1305	17.69	-26.0°	0.0929	20.64	10.0°	0.1523	16.34	46.0°	0.1285	17.82	82.0°	0.0229	32.80
-61.5°	0.1272	17.91	-25.5°	0.0756	22.44	10.5°	0.1013	19.88	46.5°	0.1235	18.17	82.5°	0.0204	33.80
-61.0°	0.1238	18.14	-25.0°	0.0582	24.70	11.0°	0.0503	25.96	47.0°	0.1185	18.53	83.0°	0.0180	34.92
-60.5°	0.1193	18.47	-24.5°	0.0380	28.41	11.5°	0.0446	27.02	47.5°	0.1116	19.05	83.5°	0.0160	35.94
-60.0°	0.1148	18.80	-24.0°	0.0177	35.05	12.0°	0.0388	28.23	48.0°	0.1047	19.60	84.0°	0.0140	37.09
-59.5°	0.1091	19.24	-23.5°	0.0222	33.06	12.5°	0.0756	22.43	48.5°	0.0964	20.32	84.5°	0.0120	38.43
-59.0°	0.1034	19.71	-23.0°	0.0268	31.44	13.0°	0.1125	18.98	49.0°	0.0880	21.11	85.0°	0.0100	40.01
-58.5°	0.0966	20.30	-22.5°	0.0498	26.05	13.5°	0.1404	17.05	49.5°	0.0784	22.12	85.5°	0.0085	41.42
-58.0°	0.0898	20.93	-22.0°	0.0729	22.75	14.0°	0.1683	15.48	50.0°	0.0687	23.26	86.0°	0.0070	43.10
-57.5°	0.0821	21.72	-21.5°	0.0953	20.42	14.5°	0.1878	14.53	50.5°	0.0583	24.69	86.5°	0.0060	44.44
-57.0°	0.0743	22.58	-21.0°	0.1177	18.58	15.0°	0.2073	13.67	51.0°	0.0478	26.41	87.0°	0.0050	46.02
-56.5°	0.0656	23.67	-20.5°	0.1382	17.19	15.5°	0.2174	13.25	51.5°	0.0369	28.65	87.5°	0.0040	47.96
-56.0°	0.0568	24.91	-20.0°	0.1586	15.99	16.0°	0.2276	12.86	52.0°	0.0261	31.68	88.0°	0.0030	50.46
-55.5°	0.0473	26.51	-19.5°	0.1756	15.11	16.5°	0.2300	12.77	52.5°	0.0150	36.47	88.5°	0.0025	52.04
-55.0°	0.0377	28.47	-19.0°	0.1925	14.31	17.0°	0.2324	12.68	53.0°	0.0040	48.04	89.0°	0.0020	53.98
-54.5°	0.0275	31.21	-18.5°	0.2044	13.79	17.5°	0.2269	12.88	53.5°	0.0109	39.29	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

6

ÂNGULO DE MEIA POTÊNCIA VERTICAL

9.23°

GANHO

5.26 dBd

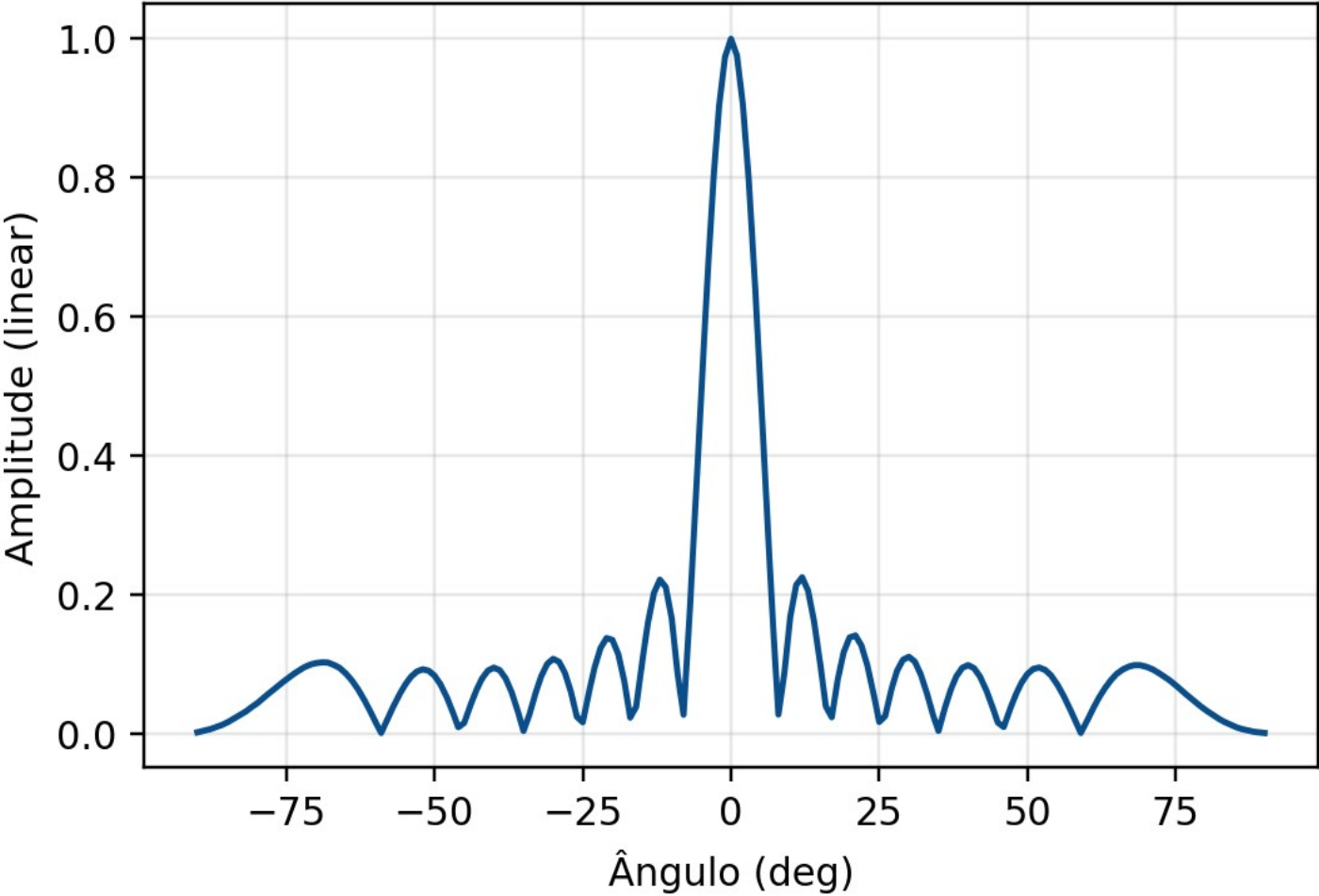
PRIMEIRO NULO

10.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.0491	26.19	-18.0°	0.0812	21.81	18.0°	0.0831	21.61	54.0°	0.0503	25.98
-89.5°	0.0030	50.46	-53.5°	0.0579	24.75	-17.5°	0.1075	19.37	18.5°	0.0549	25.21	54.5°	0.0404	27.88
-89.0°	0.0040	47.96	-53.0°	0.0667	23.51	-17.0°	0.1339	17.47	19.0°	0.0267	31.46	55.0°	0.0305	30.32
-88.5°	0.0050	46.02	-52.5°	0.0745	22.55	-16.5°	0.1563	16.12	19.5°	0.0270	31.39	55.5°	0.0203	33.84
-88.0°	0.0060	44.44	-52.0°	0.0823	21.69	-16.0°	0.1787	14.96	20.0°	0.0272	31.31	56.0°	0.0102	39.86
-87.5°	0.0075	42.50	-51.5°	0.0885	21.07	-15.5°	0.1944	14.22	20.5°	0.0508	25.89	56.5°	0.0101	39.91
-87.0°	0.0090	40.92	-51.0°	0.0946	20.48	-15.0°	0.2102	13.55	21.0°	0.0743	22.58	57.0°	0.0100	39.96
-86.5°	0.0105	39.58	-50.5°	0.0990	20.09	-14.5°	0.2171	13.27	21.5°	0.0928	20.65	57.5°	0.0197	34.09
-86.0°	0.0120	38.42	-50.0°	0.1033	19.72	-14.0°	0.2241	12.99	22.0°	0.1112	19.08	58.0°	0.0295	30.62
-85.5°	0.0140	37.09	-49.5°	0.1054	19.55	-13.5°	0.2199	13.15	22.5°	0.1235	18.17	58.5°	0.0389	28.19
-85.0°	0.0160	35.93	-49.0°	0.1074	19.38	-13.0°	0.2158	13.32	23.0°	0.1358	17.34	59.0°	0.0484	26.30
-84.5°	0.0185	34.67	-48.5°	0.1071	19.40	-12.5°	0.1993	14.01	23.5°	0.1413	17.00	59.5°	0.0560	25.03
-84.0°	0.0210	33.57	-48.0°	0.1068	19.43	-12.0°	0.1828	14.76	24.0°	0.1468	16.66	60.0°	0.0636	23.93
-83.5°	0.0234	32.61	-47.5°	0.1038	19.67	-11.5°	0.1534	16.28	24.5°	0.1457	16.73	60.5°	0.0710	22.98
-83.0°	0.0259	31.73	-47.0°	0.1009	19.93	-11.0°	0.1240	18.13	25.0°	0.1446	16.79	61.0°	0.0783	22.12
-82.5°	0.0284	30.95	-46.5°	0.0954	20.41	-10.5°	0.0820	21.72	25.5°	0.1375	17.23	61.5°	0.0843	21.49
-82.0°	0.0308	30.23	-46.0°	0.0900	20.92	-10.0°	0.0400	27.95	26.0°	0.1304	17.69	62.0°	0.0902	20.89
-81.5°	0.0342	29.31	-45.5°	0.0821	21.72	-9.5°	0.0532	25.48	26.5°	0.1183	18.54	62.5°	0.0949	20.46
-81.0°	0.0376	28.49	-45.0°	0.0741	22.60	-9.0°	0.0664	23.55	27.0°	0.1061	19.49	63.0°	0.0995	20.04
-80.5°	0.0405	27.85	-44.5°	0.0640	23.88	-8.5°	0.1287	17.81	27.5°	0.0902	20.89	63.5°	0.1031	19.74
-80.0°	0.0434	27.26	-44.0°	0.0539	25.37	-8.0°	0.1910	14.38	28.0°	0.0744	22.57	64.0°	0.1066	19.44
-79.5°	0.0471	26.53	-43.5°	0.0420	27.53	-7.5°	0.2594	11.72	28.5°	0.0562	25.01	64.5°	0.1092	19.24
-79.0°	0.0509	25.86	-43.0°	0.0302	30.40	-7.0°	0.3278	9.69	29.0°	0.0379	28.42	65.0°	0.1118	19.03
-78.5°	0.0546	25.26	-42.5°	0.0172	35.29	-6.5°	0.3987	7.99	29.5°	0.0194	34.25	65.5°	0.1128	18.95
-78.0°	0.0583	24.69	-42.0°	0.0042	47.58	-6.0°	0.4695	6.57	30.0°	0.0008	61.87	66.0°	0.1139	18.87
-77.5°	0.0618	24.18	-41.5°	0.0135	37.41	-5.5°	0.5390	5.37	30.5°	0.0179	34.95	66.5°	0.1141	18.86
-77.0°	0.0653	23.70	-41.0°	0.0228	32.85	-5.0°	0.6084	4.32	31.0°	0.0350	29.13	67.0°	0.1142	18.84
-76.5°	0.0692	23.20	-40.5°	0.0359	28.89	-4.5°	0.6723	3.45	31.5°	0.0506	25.91	67.5°	0.1137	18.88
-76.0°	0.0730	22.74	-40.0°	0.0491	26.19	-4.0°	0.7361	2.66	32.0°	0.0663	23.57	68.0°	0.1132	18.93
-75.5°	0.0766	22.32	-39.5°	0.0611	24.28	-3.5°	0.7907	2.04	32.5°	0.0791	22.04	68.5°	0.1117	19.04
-75.0°	0.0802	21.92	-39.0°	0.0731	22.72	-3.0°	0.8453	1.46	33.0°	0.0918	20.74	69.0°	0.1102	19.16
-74.5°	0.0839	21.52	-38.5°	0.0830	21.61	-2.5°	0.8869	1.04	33.5°	0.1006	19.95	69.5°	0.1078	19.34
-74.0°	0.0876	21.15	-38.0°	0.0930	20.63	-2.0°	0.9286	0.64	34.0°	0.1094	19.22	70.0°	0.1055	19.54
-73.5°	0.0910	20.82	-37.5°	0.1002	19.98	-1.5°	0.9546	0.40	34.5°	0.1140	18.87	70.5°	0.1028	19.76
-73.0°	0.0944	20.50	-37.0°	0.1073	19.38	-1.0°	0.9806	0.17	35.0°	0.1185	18.53	71.0°	0.1001	20.00
-72.5°	0.0978	20.20	-36.5°	0.1110	19.09	-0.5°	0.9903	0.08	35.5°	0.1187	18.51	71.5°	0.0967	20.29
-72.0°	0.1011	19.90	-36.0°	0.1146	18.81	0.0°	1.0000	0.00	36.0°	0.1190	18.49	72.0°	0.0933	20.60
-71.5°	0.1039	19.67	-35.5°	0.1145	18.83	0.5°	0.9913	0.08	36.5°	0.1151	18.78	72.5°	0.0899	20.93
-71.0°	0.1067	19.43	-35.0°	0.1143	18.84	1.0°	0.9826	0.15	37.0°	0.1113	19.07	73.0°	0.0864	21.27
-70.5°	0.1089	19.26	-34.5°	0.1099	19.18	1.5°	0.9565	0.39	37.5°	0.1039	19.67	73.5°	0.0829	21.63
-70.0°	0.1111	19.09	-34.0°	0.1055	19.54	2.0°	0.9304	0.63	38.0°	0.0965	20.31	74.0°	0.0794	22.00
-69.5°	0.1129	18.95	-33.5°	0.0970	20.26	2.5°	0.8896	1.02	38.5°	0.0862	21.29	74.5°	0.0756	22.43
-69.0°	0.1147	18.80	-33.0°	0.0885	21.06	3.0°	0.8487	1.43	39.0°	0.0758	22.41	75.0°	0.0718	22.88
-68.5°	0.1161	18.70	-32.5°	0.0764	22.34	3.5°	0.7942	2.00	39.5°	0.0634	23.96	75.5°	0.0676	23.40
-68.0°	0.1175	18.60	-32.0°	0.0642	23.85	4.0°	0.7398	2.62	40.0°	0.0509	25.86	76.0°	0.0635	23.94
-67.5°	0.1175	18.60	-31.5°	0.0490	26.20	4.5°	0.6763	3.40	40.5°	0.0373	28.57	76.5°	0.0596	24.49
-67.0°	0.1176	18.59	-31.0°	0.0338	29.43	5.0°	0.6128	4.25	41.0°	0.0236	32.53	77.0°	0.0557	25.08
-66.5°	0.1173	18.62	-30.5°	0.0173	35.25	5.5°	0.5430	5.30	41.5°	0.0140	37.09	77.5°	0.0521	25.66
-66.0°	0.1169	18.64	-30.0°	0.0008	62.11	6.0°	0.4733	6.50	42.0°	0.0043	47.26	78.0°	0.0486	26.28
-65.5°	0.1152	18.77	-29.5°	0.0189	34.49	6.5°	0.4021	7.91	42.5°	0.0178	34.97	78.5°	0.0448	26.97
-65.0°	0.1134	18.90	-29.0°	0.0369	28.65	7.0°	0.3308	9.61	43.0°	0.0314	30.07	79.0°	0.0411	27.72
-64.5°	0.1108	19.11	-28.5°	0.0544	25.28	7.5°	0.2620	11.63	43.5°	0.0436	27.21	79.5°	0.0378	28.45
-64.0°	0.1081	19.32	-28.0°	0.0719	22.86	8.0°	0.1931	14.28	44.0°	0.0559	25.06	80.0°	0.0345	29.24
-63.5°	0.1043	19.64	-27.5°	0.0873	21.18	8.5°	0.1302	17.71	44.5°	0.0663	23.57	80.5°	0.0316	30.00
-63.0°	0.1004	19.97	-27.0°	0.1027	19.77	9.0°	0.0673	23.45	45.0°	0.0767	22.30	81.0°	0.0287	30.84
-62.5°	0.0953	20.42	-26.5°	0.1146	18.82	9.5°	0.0539	25.37	45.5°	0.0850	21.42	81.5°	0.0258	31.77
-62.0°	0.0902	20.89	-26.0°	0.1264	17.97	10.0°	0.0406	27.84	46.0°	0.0932	20.61	82.0°	0.0229	32.82
-61.5°	0.0841	21.50	-25.5°	0.1334	17.50	10.5°	0.0832	21.60	46.5°	0.0988	20.10	82.5°	0.0204	33.81
-61.0°	0.0780	22.15	-25.0°	0.1404	17.05	11.0°	0.1258	18.01	47.0°	0.1044	19.63	83.0°	0.0179	34.93
-60.5°	0.0708	23.00	-24.5°	0.1415	16.99	11.5°	0.1557	16.15	47.5°	0.1073	19.39	83.5°	0.0160	35.94
-60.0°	0.0636	23.93	-24.0°	0.1425	16.92	12.0°	0.1856	14.63	48.0°	0.1102	19.15	84.0°	0.0140	37.10
-59.5°	0.0554	25.14	-23.5°	0.1372	17.25	12.5°	0.2026	13.87	48.5°	0.1106	19.12	84.5°	0.0120	38.43
-59.0°	0.0471	26.53	-23.0°	0.1319	17.60	13.0°	0.2195	13.17	49.0°	0.1110	19.10	85.0°	0.0100	40.01
-58.5°	0.0381	28.38	-22.5°	0.1200	18.41	13.5°	0.2233	13.02	49.5°	0.1087	19.28	85.5°	0.0085	41.42
-58.0°	0.0291	30.73	-22.0°	0.1082	19.31	14.0°	0.2272	12.87	50.0°	0.1064	19.46	86.0°	0.0070	43.10
-57.5°	0.0195	34.21	-21.5°	0.0903	20.89	14.5°	0.2206	13.13	50.5°	0.1019	19.84	86.5°	0.0060	44.44
-57.0°	0.0099	40.10	-21.0°	0.0723	22.81	15.0°	0.2140	13.39	51.0°	0.0973	20.24	87.0°	0.0050	46.02
-56.5°	0.0099	40.06	-20.5°	0.0494	26.12	15.5°	0.1978	14.08	51.5°	0.0909	20.83	87.5°	0.0040	47.96
-56.0°	0.0100	40.02	-20.0°	0.0265	31.54	16.0°	0.1816	14.82	52.0°	0.0846	21.46	88.0°	0.0030	50.46
-55.5°	0.0199	34.01	-19.5°	0.0263	31.60	16.5°	0.1591	15.97	52.5°	0.0765	22.33	88.5°	0.0025	52.04
-55.0°	0.0299	30.49	-19.0°	0.0261	31.67	17.0°	0.1366	17.29	53.0°	0.0685	23.29	89.0°	0.0020	53.98
-54.5°	0.0395	28.08	-18.5°	0.0536	25.41	17.5°	0.1099	19.18	53.5°	0.0594	24.53	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

7

ÂNGULO DE MEIA POTÊNCIA VERTICAL

7.61°

GANHO

5.94 dBd

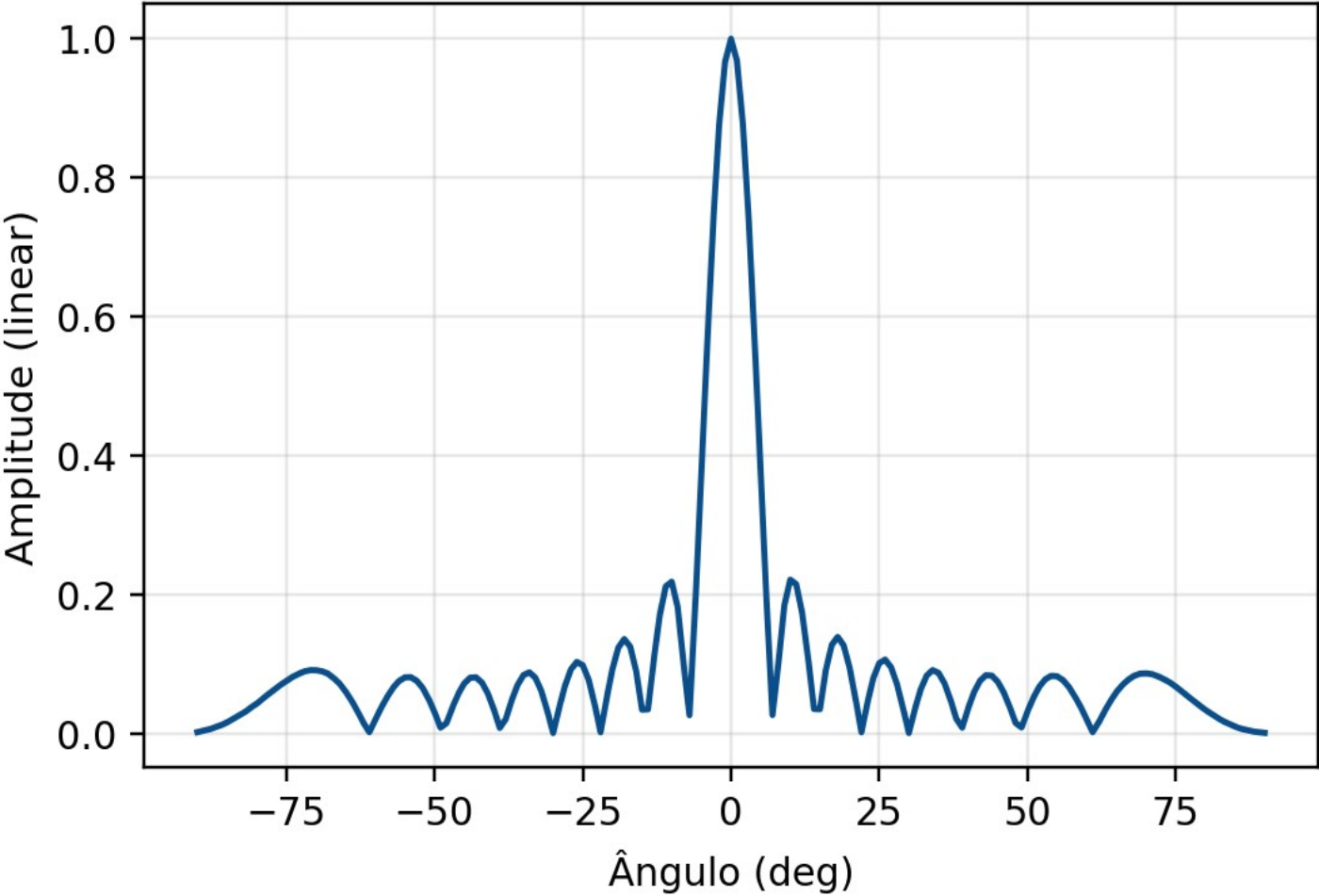
PRIMEIRO NULO

8.00°

Tabela completa - Elevação



Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB	Ângulo	E/E _{max}	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.0817	21.76	-18.0°	0.0759	22.40	18.0°	0.0777	22.20	54.0°	0.0837	21.55
-89.5°	0.0030	50.46	-53.5°	0.0855	21.36	-17.5°	0.0495	26.10	18.5°	0.0973	20.23	54.5°	0.0776	22.21
-89.0°	0.0040	47.96	-53.0°	0.0894	20.97	-17.0°	0.0232	32.69	19.0°	0.1170	18.64	55.0°	0.0715	22.92
-88.5°	0.0050	46.02	-52.5°	0.0910	20.82	-16.5°	0.0309	30.20	19.5°	0.1277	17.87	55.5°	0.0639	23.90
-88.0°	0.0060	44.44	-52.0°	0.0927	20.66	-16.0°	0.0386	28.26	20.0°	0.1385	17.17	56.0°	0.0563	24.99
-87.5°	0.0075	42.50	-51.5°	0.0917	20.75	-15.5°	0.0705	23.04	20.5°	0.1399	17.08	56.5°	0.0476	26.45
-87.0°	0.0090	40.92	-51.0°	0.0907	20.85	-15.0°	0.1024	19.80	21.0°	0.1413	16.99	57.0°	0.0389	28.21
-86.5°	0.0105	39.58	-50.5°	0.0871	21.20	-14.5°	0.1312	17.64	21.5°	0.1341	17.45	57.5°	0.0295	30.60
-86.0°	0.0120	38.42	-50.0°	0.0835	21.56	-14.0°	0.1600	15.92	22.0°	0.1268	17.94	58.0°	0.0202	33.90
-85.5°	0.0140	37.09	-49.5°	0.0773	22.24	-13.5°	0.1812	14.84	22.5°	0.1125	18.97	58.5°	0.0107	39.43
-85.0°	0.0160	35.93	-49.0°	0.0711	22.97	-13.0°	0.2025	13.87	23.0°	0.0982	20.15	59.0°	0.0012	58.66
-84.5°	0.0185	34.68	-48.5°	0.0625	24.08	-12.5°	0.2121	13.47	23.5°	0.0791	22.04	59.5°	0.0093	40.64
-84.0°	0.0209	33.58	-48.0°	0.0540	25.35	-12.0°	0.2216	13.09	24.0°	0.0599	24.45	60.0°	0.0174	35.19
-83.5°	0.0234	32.62	-47.5°	0.0435	27.23	-11.5°	0.2163	13.30	24.5°	0.0385	28.30	60.5°	0.0263	31.61
-83.0°	0.0259	31.75	-47.0°	0.0330	29.64	-11.0°	0.2110	13.52	25.0°	0.0170	35.37	61.0°	0.0351	29.09
-82.5°	0.0283	30.96	-46.5°	0.0211	33.50	-10.5°	0.1885	14.49	25.5°	0.0211	33.50	61.5°	0.0431	27.32
-82.0°	0.0307	30.25	-46.0°	0.0093	40.62	-10.0°	0.1660	15.60	26.0°	0.0252	31.96	62.0°	0.0510	25.84
-81.5°	0.0341	29.34	-45.5°	0.0124	38.11	-9.5°	0.1260	18.00	26.5°	0.0438	27.18	62.5°	0.0579	24.75
-81.0°	0.0375	28.52	-45.0°	0.0155	36.17	-9.0°	0.0859	21.32	27.0°	0.0623	24.11	63.0°	0.0648	23.77
-80.5°	0.0403	27.89	-44.5°	0.0277	31.16	-8.5°	0.0566	24.94	27.5°	0.0763	22.34	63.5°	0.0706	23.03
-80.0°	0.0431	27.30	-44.0°	0.0398	28.00	-8.0°	0.0273	31.27	28.0°	0.0904	20.87	64.0°	0.0763	22.34
-79.5°	0.0468	26.59	-43.5°	0.0507	25.90	-7.5°	0.0975	20.22	28.5°	0.0984	20.14	64.5°	0.0811	21.82
-79.0°	0.0505	25.93	-43.0°	0.0617	24.20	-7.0°	0.1678	15.51	29.0°	0.1063	19.47	65.0°	0.0858	21.33
-78.5°	0.0541	25.34	-42.5°	0.0705	23.04	-6.5°	0.2471	12.14	29.5°	0.1085	19.29	65.5°	0.0889	21.02
-78.0°	0.0576	24.79	-42.0°	0.0793	22.02	-6.0°	0.3264	9.73	30.0°	0.1107	19.12	66.0°	0.0921	20.71
-77.5°	0.0610	24.29	-41.5°	0.0850	21.41	-5.5°	0.4092	7.76	30.5°	0.1073	19.39	66.5°	0.0942	20.52
-77.0°	0.0644	23.83	-41.0°	0.0908	20.84	-5.0°	0.4921	6.16	31.0°	0.1039	19.67	67.0°	0.0963	20.33
-76.5°	0.0679	23.36	-40.5°	0.0929	20.64	-4.5°	0.5720	4.85	31.5°	0.0947	20.47	67.5°	0.0975	20.22
-76.0°	0.0715	22.91	-40.0°	0.0951	20.44	-4.0°	0.6518	3.72	32.0°	0.0855	21.36	68.0°	0.0986	20.12
-75.5°	0.0748	22.52	-39.5°	0.0932	20.61	-3.5°	0.7225	2.82	32.5°	0.0726	22.78	68.5°	0.0986	20.12
-75.0°	0.0780	22.15	-39.0°	0.0914	20.78	-3.0°	0.7933	2.01	33.0°	0.0597	24.48	69.0°	0.0986	20.12
-74.5°	0.0814	21.79	-38.5°	0.0854	21.37	-2.5°	0.8486	1.43	33.5°	0.0442	27.09	69.5°	0.0976	20.21
-74.0°	0.0847	21.45	-38.0°	0.0794	22.00	-2.0°	0.9039	0.88	34.0°	0.0287	30.85	70.0°	0.0965	20.31
-73.5°	0.0875	21.16	-37.5°	0.0696	23.15	-1.5°	0.9390	0.55	34.5°	0.0163	35.73	70.5°	0.0948	20.46
-73.0°	0.0903	20.89	-37.0°	0.0598	24.46	-1.0°	0.9742	0.23	35.0°	0.0040	47.91	71.0°	0.0932	20.61
-72.5°	0.0929	20.64	-36.5°	0.0469	26.58	-0.5°	0.9871	0.11	35.5°	0.0196	34.16	71.5°	0.0907	20.85
-72.0°	0.0955	20.40	-36.0°	0.0339	29.40	0.0°	1.0000	0.00	36.0°	0.0352	29.08	72.0°	0.0882	21.09
-71.5°	0.0975	20.22	-35.5°	0.0189	34.48	0.5°	0.9881	0.10	36.5°	0.0486	26.27	72.5°	0.0854	21.37
-71.0°	0.0994	20.05	-35.0°	0.0039	48.23	1.0°	0.9762	0.21	37.0°	0.0620	24.15	73.0°	0.0826	21.66
-70.5°	0.1005	19.96	-34.5°	0.0158	36.05	1.5°	0.9409	0.53	37.5°	0.0722	22.83	73.5°	0.0797	21.97
-70.0°	0.1016	19.86	-34.0°	0.0276	31.17	2.0°	0.9057	0.86	38.0°	0.0824	21.68	74.0°	0.0767	22.30
-69.5°	0.1022	19.81	-33.5°	0.0426	27.41	2.5°	0.8511	1.40	38.5°	0.0886	21.05	74.5°	0.0733	22.70
-69.0°	0.1027	19.77	-33.0°	0.0576	24.79	3.0°	0.7964	1.98	39.0°	0.0948	20.46	75.0°	0.0699	23.11
-68.5°	0.1025	19.78	-32.5°	0.0702	23.07	3.5°	0.7258	2.78	39.5°	0.0968	20.29	75.5°	0.0661	23.60
-68.0°	0.1024	19.80	-32.0°	0.0828	21.64	4.0°	0.6551	3.67	40.0°	0.0987	20.11	76.0°	0.0622	24.12
-67.5°	0.1008	19.93	-31.5°	0.0916	20.76	4.5°	0.5754	4.80	40.5°	0.0965	20.31	76.5°	0.0586	24.65
-67.0°	0.0991	20.07	-31.0°	0.1003	19.97	5.0°	0.4956	6.10	41.0°	0.0942	20.52	77.0°	0.0549	25.21
-66.5°	0.0969	20.28	-30.5°	0.1040	19.66	5.5°	0.4123	7.70	41.5°	0.0882	21.09	77.5°	0.0515	25.77
-66.0°	0.0946	20.48	-30.0°	0.1077	19.35	6.0°	0.3290	9.66	42.0°	0.0822	21.70	78.0°	0.0480	26.37
-65.5°	0.0908	20.84	-29.5°	0.1056	19.53	6.5°	0.2492	12.07	42.5°	0.0731	22.72	78.5°	0.0444	27.05
-65.0°	0.0870	21.20	-29.0°	0.1035	19.70	7.0°	0.1693	15.43	43.0°	0.0640	23.87	79.0°	0.0408	27.78
-64.5°	0.0822	21.70	-28.5°	0.0955	20.40	7.5°	0.0985	20.13	43.5°	0.0526	25.57	79.5°	0.0376	28.51
-64.0°	0.0774	22.22	-28.0°	0.0874	21.17	8.0°	0.0276	31.17	44.0°	0.0413	27.68	80.0°	0.0343	29.29
-63.5°	0.0714	22.93	-27.5°	0.0739	22.63	8.5°	0.0573	24.84	44.5°	0.0287	30.85	80.5°	0.0315	30.04
-63.0°	0.0653	23.70	-27.0°	0.0603	24.39	9.0°	0.0869	21.22	45.0°	0.0161	35.87	81.0°	0.0286	30.87
-62.5°	0.0582	24.70	-26.5°	0.0424	27.46	9.5°	0.1276	17.88	45.5°	0.0129	37.81	81.5°	0.0257	31.80
-62.0°	0.0510	25.84	-26.0°	0.0245	32.23	10.0°	0.1683	15.48	46.0°	0.0096	40.32	82.0°	0.0228	32.84
-61.5°	0.0430	27.33	-25.5°	0.0205	33.77	10.5°	0.1912	14.37	46.5°	0.0219	33.20	82.5°	0.0204	33.83
-61.0°	0.0350	29.12	-25.0°	0.0165	35.63	11.0°	0.2140	13.39	47.0°	0.0341	29.34	83.0°	0.0179	34.94
-60.5°	0.0262	31.64	-24.5°	0.0373	28.56	11.5°	0.2196	13.17	47.5°	0.0449	26.95	83.5°	0.0159	35.95
-60.0°	0.0174	35.19	-24.0°	0.0582	24.71	12.0°	0.2251	12.95	48.0°	0.0557	25.08	84.0°	0.0140	37.10
-59.5°	0.0093	40.66	-23.5°	0.0768	22.29	12.5°	0.2155	13.33	48.5°	0.0646	23.80	84.5°	0.0120	38.44
-59.0°	0.0011	58.89	-23.0°	0.0954	20.41	13.0°	0.2059	13.73	49.0°	0.0734	22.68	85.0°	0.0100	40.01
-58.5°	0.0105	39.55	-22.5°	0.1094	19.22	13.5°	0.1841	14.70	49.5°	0.0797	21.97	85.5°	0.0085	41.42
-58.0°	0.0199	34.01	-22.0°	0.1234	18.18	14.0°	0.1622	15.80	50.0°	0.0860	21.31	86.0°	0.0070	43.10
-57.5°	0.0291	30.72	-21.5°	0.1305	17.69	14.5°	0.1332	17.51	50.5°	0.0897	20.95	86.5°	0.0060	44.44
-57.0°	0.0383	28.34	-21.0°	0.1376	17.23	15.0°	0.1043	19.64	51.0°	0.0933	20.61	87.0°	0.0050	46.02
-56.5°	0.0468	26.60	-20.5°	0.1362	17.31	15.5°	0.0718	22.88	51.5°	0.0942	20.51	87.5°	0.0040	47.96
-56.0°	0.0553	25.15	-20.0°	0.1349	17.40	16.0°	0.0392	28.12	52.0°	0.0952	20.43	88.0°	0.0030	50.46
-55.5°	0.0627	24.06	-19.5°	0.1246	18.09	16.5°	0.0315	30.04	52.5°	0.0935	20.59	88.5°	0.0025	52.04
-55.0°	0.0701	23.09	-19.0°	0.1142	18.85	17.0°	0.0237	32.51	53.0°	0.0917	20.75	89.0°	0.0020	53.98
-54.5°	0.0759	22.40	-18.5°	0.0950	20.44	17.5°	0.0507	25.90	53.5°	0.0877	21.14	89.5°	0.0015	56.48



Parâmetros da configuração

ELEMENTOS VERTICAIS

8

ÂNGULO DE MEIA POTÊNCIA VERTICAL

7.16°

GANHO

6.53 dBd

PRIMEIRO NULO

7.00°

Tabela completa - Elevação



Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB	Ângulo	E/Emax	Aten. dB
-90.0°	0.0020	53.98	-54.0°	0.0811	21.82	-18.0°	0.1359	17.33	18.0°	0.1391	17.13	54.0°	0.0831	21.61
-89.5°	0.0030	50.46	-53.5°	0.0785	22.10	-17.5°	0.1305	17.69	18.5°	0.1330	17.52	54.5°	0.0827	21.65
-89.0°	0.0040	47.96	-53.0°	0.0760	22.39	-17.0°	0.1251	18.06	19.0°	0.1268	17.93	55.0°	0.0824	21.68
-88.5°	0.0050	46.02	-52.5°	0.0708	23.00	-16.5°	0.1076	19.36	19.5°	0.1110	19.09	55.5°	0.0797	21.97
-88.0°	0.0060	44.44	-52.0°	0.0656	23.66	-16.0°	0.0902	20.90	20.0°	0.0952	20.43	56.0°	0.0769	22.28
-87.5°	0.0075	42.50	-51.5°	0.0579	24.74	-15.5°	0.0623	24.11	20.5°	0.0730	22.73	56.5°	0.0719	22.86
-87.0°	0.0090	40.92	-51.0°	0.0502	25.98	-15.0°	0.0345	29.26	21.0°	0.0509	25.87	57.0°	0.0669	23.49
-86.5°	0.0105	39.58	-50.5°	0.0405	27.85	-14.5°	0.0347	29.19	21.5°	0.0264	31.57	57.5°	0.0602	24.41
-86.0°	0.0120	38.43	-50.0°	0.0308	30.23	-14.0°	0.0350	29.13	22.0°	0.0019	54.31	58.0°	0.0534	25.44
-85.5°	0.0140	37.09	-49.5°	0.0197	34.12	-13.5°	0.0713	22.93	22.5°	0.0229	32.81	58.5°	0.0458	26.78
-85.0°	0.0160	35.94	-49.0°	0.0085	41.38	-13.0°	0.1077	19.35	23.0°	0.0438	27.16	59.0°	0.0382	28.37
-84.5°	0.0184	34.68	-48.5°	0.0117	38.64	-12.5°	0.1394	17.12	23.5°	0.0618	24.18	59.5°	0.0290	30.74
-84.0°	0.0209	33.59	-48.0°	0.0149	36.56	-12.0°	0.1710	15.34	24.0°	0.0798	21.96	60.0°	0.0199	34.02
-83.5°	0.0234	32.63	-47.5°	0.0261	31.66	-11.5°	0.1915	14.36	24.5°	0.0905	20.87	60.5°	0.0110	39.19
-83.0°	0.0258	31.76	-47.0°	0.0374	28.54	-11.0°	0.2119	13.48	25.0°	0.1013	19.89	61.0°	0.0020	53.81
-82.5°	0.0282	30.98	-46.5°	0.0473	26.51	-10.5°	0.2152	13.34	25.5°	0.1038	19.67	61.5°	0.0088	41.09
-82.0°	0.0307	30.27	-46.0°	0.0571	24.86	-10.0°	0.2184	13.21	26.0°	0.1064	19.46	62.0°	0.0156	36.14
-81.5°	0.0340	29.37	-45.5°	0.0646	23.80	-9.5°	0.2004	13.96	26.5°	0.1009	19.92	62.5°	0.0238	32.46
-81.0°	0.0373	28.56	-45.0°	0.0721	22.85	-9.0°	0.1823	14.78	27.0°	0.0954	20.41	63.0°	0.0320	29.88
-80.5°	0.0401	27.94	-44.5°	0.0762	22.36	-8.5°	0.1411	17.01	27.5°	0.0832	21.59	63.5°	0.0394	28.08
-80.0°	0.0429	27.36	-44.0°	0.0803	21.91	-8.0°	0.0999	20.01	28.0°	0.0711	22.96	64.0°	0.0468	26.59
-79.5°	0.0465	26.66	-43.5°	0.0806	21.87	-7.5°	0.0632	23.99	28.5°	0.0543	25.30	64.5°	0.0533	25.47
-79.0°	0.0501	26.01	-43.0°	0.0809	21.84	-7.0°	0.0265	31.54	29.0°	0.0375	28.51	65.0°	0.0597	24.48
-78.5°	0.0535	25.44	-42.5°	0.0771	22.26	-6.5°	0.1075	19.37	29.5°	0.0192	34.35	65.5°	0.0648	23.77
-78.0°	0.0569	24.90	-42.0°	0.0733	22.70	-6.0°	0.1886	14.49	30.0°	0.0008	61.87	66.0°	0.0698	23.12
-77.5°	0.0601	24.43	-41.5°	0.0654	23.69	-5.5°	0.2807	11.04	30.5°	0.0177	35.04	66.5°	0.0737	22.85
-77.0°	0.0632	23.98	-41.0°	0.0575	24.80	-5.0°	0.3728	8.57	31.0°	0.0346	29.22	67.0°	0.0776	22.21
-76.5°	0.0665	23.54	-40.5°	0.0463	26.68	-4.5°	0.4671	6.61	31.5°	0.0491	26.18	67.5°	0.0804	21.90
-76.0°	0.0699	23.12	-40.0°	0.0352	29.08	-4.0°	0.5614	5.01	32.0°	0.0636	23.93	68.0°	0.0831	21.60
-75.5°	0.0728	22.76	-39.5°	0.0217	33.28	-3.5°	0.6485	3.76	32.5°	0.0735	22.68	68.5°	0.0846	21.45
-75.0°	0.0756	22.42	-39.0°	0.0082	41.70	-3.0°	0.7355	2.67	33.0°	0.0833	21.58	69.0°	0.0861	21.30
-74.5°	0.0785	22.11	-38.5°	0.0144	36.85	-2.5°	0.8057	1.88	33.5°	0.0873	21.18	69.5°	0.0864	21.27
-74.0°	0.0813	21.80	-38.0°	0.0205	33.76	-2.0°	0.8759	1.15	34.0°	0.0913	20.79	70.0°	0.0867	21.24
-73.5°	0.0835	21.57	-37.5°	0.0341	29.34	-1.5°	0.9214	0.71	34.5°	0.0893	20.99	70.5°	0.0861	21.30
-73.0°	0.0857	21.34	-37.0°	0.0477	26.43	-1.0°	0.9668	0.29	35.0°	0.0873	21.18	71.0°	0.0856	21.35
-72.5°	0.0875	21.16	-36.5°	0.0588	24.61	-0.5°	0.9834	0.15	35.5°	0.0799	21.95	71.5°	0.0840	21.51
-72.0°	0.0894	20.98	-36.0°	0.0699	23.11	0.0°	1.0000	0.00	36.0°	0.0725	22.79	72.0°	0.0825	21.67
-71.5°	0.0903	20.88	-35.5°	0.0770	22.27	0.5°	0.9844	0.14	36.5°	0.0610	24.29	72.5°	0.0804	21.89
-71.0°	0.0913	20.79	-35.0°	0.0842	21.50	1.0°	0.9688	0.28	37.0°	0.0495	26.11	73.0°	0.0784	22.11
-70.5°	0.0913	20.79	-34.5°	0.0861	21.30	1.5°	0.9232	0.69	37.5°	0.0354	29.02	73.5°	0.0760	22.38
-70.0°	0.0913	20.79	-34.0°	0.0880	21.11	2.0°	0.8777	1.13	38.0°	0.0213	33.43	74.0°	0.0737	22.65
-69.5°	0.0905	20.87	-33.5°	0.0842	21.49	2.5°	0.8081	1.85	38.5°	0.0149	36.53	74.5°	0.0707	23.01
-69.0°	0.0897	20.94	-33.0°	0.0804	21.90	3.0°	0.7385	2.63	39.0°	0.0085	41.39	75.0°	0.0677	23.38
-68.5°	0.0880	21.11	-32.5°	0.0710	22.98	3.5°	0.6514	3.72	39.5°	0.0225	32.95	75.5°	0.0643	23.84
-68.0°	0.0863	21.28	-32.0°	0.0616	24.21	4.0°	0.5642	4.97	40.0°	0.0365	28.75	76.0°	0.0608	24.32
-67.5°	0.0831	21.61	-31.5°	0.0475	26.46	4.5°	0.4698	6.56	40.5°	0.0481	26.36	76.5°	0.0574	24.83
-67.0°	0.0798	21.96	-31.0°	0.0334	29.52	5.0°	0.3755	8.51	41.0°	0.0597	24.48	77.0°	0.0539	25.36
-66.5°	0.0758	22.41	-30.5°	0.0171	35.34	5.5°	0.2828	10.97	41.5°	0.0678	23.37	77.5°	0.0507	25.90
-66.0°	0.0717	22.89	-30.0°	0.0008	62.11	6.0°	0.1901	14.42	42.0°	0.0760	22.39	78.0°	0.0474	26.48
-65.5°	0.0662	23.59	-29.5°	0.0187	34.58	6.5°	0.1084	19.30	42.5°	0.0800	21.94	78.5°	0.0439	27.14
-65.0°	0.0606	24.35	-29.0°	0.0365	28.75	7.0°	0.0267	31.46	43.0°	0.0840	21.51	79.0°	0.0404	27.86
-64.5°	0.0541	25.34	-28.5°	0.0526	25.58	7.5°	0.0639	23.89	43.5°	0.0836	21.55	79.5°	0.0373	28.57
-64.0°	0.0475	26.47	-28.0°	0.0687	23.26	8.0°	0.1010	19.91	44.0°	0.0833	21.59	80.0°	0.0341	29.35
-63.5°	0.0399	27.98	-27.5°	0.0805	21.88	8.5°	0.1428	16.90	44.5°	0.0789	22.05	80.5°	0.0313	30.09
-63.0°	0.0323	29.81	-27.0°	0.0924	20.69	9.0°	0.1846	14.68	45.0°	0.0746	22.55	81.0°	0.0285	30.90
-62.5°	0.0240	32.41	-26.5°	0.0977	20.20	9.5°	0.2030	13.85	45.5°	0.0669	23.49	81.5°	0.0256	31.83
-62.0°	0.0156	36.14	-26.0°	0.1031	19.74	10.0°	0.2214	13.10	46.0°	0.0592	24.55	82.0°	0.0227	32.86
-61.5°	0.0088	41.09	-25.5°	0.1007	19.94	10.5°	0.2182	13.22	46.5°	0.0489	26.21	82.5°	0.0203	33.85
-61.0°	0.0020	53.84	-25.0°	0.0983	20.15	11.0°	0.2150	13.35	47.0°	0.0387	28.24	83.0°	0.0179	34.95
-60.5°	0.0110	39.19	-24.5°	0.0879	21.12	11.5°	0.1944	14.23	47.5°	0.0270	31.37	83.5°	0.0159	35.97
-60.0°	0.0199	34.02	-24.0°	0.0774	22.22	12.0°	0.1737	15.20	48.0°	0.0153	36.29	84.0°	0.0139	37.11
-59.5°	0.0285	30.89	-23.5°	0.0600	24.44	12.5°	0.1416	16.98	48.5°	0.0121	38.36	84.5°	0.0120	38.44
-59.0°	0.0371	28.60	-23.0°	0.0426	27.41	13.0°	0.1095	19.21	49.0°	0.0088	41.09	85.0°	0.0100	40.02
-58.5°	0.0449	26.95	-22.5°	0.0222	33.06	13.5°	0.0725	22.79	49.5°	0.0203	33.86	85.5°	0.0085	41.43
-58.0°	0.0527	25.56	-22.0°	0.0019	54.55	14.0°	0.0355	29.01	50.0°	0.0317	29.97	86.0°	0.0070	43.11
-57.5°	0.0593	24.54	-21.5°	0.0257	31.80	14.5°	0.0353	29.05	50.5°	0.0417	27.60	86.5°	0.0060	44.44
-57.0°	0.0659	23.62	-21.0°	0.0495	26.10	15.0°	0.0351	29.10	51.0°	0.0517	25.74	87.0°	0.0050	46.02
-56.5°	0.0707	23.01	-20.5°	0.0711	22.96	15.5°	0.0634	23.96	51.5°	0.0596	24.50	87.5°	0.0040	47.96
-56.0°	0.0756	22.43	-20.0°	0.0927	20.66	16.0°	0.0916	20.76	52.0°	0.0674	23.42	88.0°	0.0030	50.46
-55.5°	0.0782	22.14	-19.5°	0.1083	19.31	16.5°	0.1097	19.20	52.5°	0.0727	22.77	88.5°	0.0025	52.04
-55.0°	0.0808	21.85	-19.0°	0.1238	18.15	17.0°	0.1277	17.88	53.0°	0.0779	22.17	89.0°	0.0020	53.98
-54.5°	0.0809	21.84	-18.5°	0.1299	17.73	17.5°	0.1334	17.50	53.5°	0.0805	21.89	89.5°	0.0015	56.48