How to Use the Standard Value Capacitor (SVC) Filter Tables

Detailed instructions for using these tables appear in the Filters chapter. If you are unfamiliar with filter design from tables, look there to learn the basics. This simple example is intended as a memory aid, not a tutorial.

Let's design a low-pass filter for a 20-m CW transmitter. Based on measurements of the second harmonic, insertion loss (attenuation) should be at least 20 dB at the minimum second-harmonic frequency (28 MHz). Insertion loss should be minimal at the maximum operating frequency (14.1 MHz).

When choosing a filter, look for appropriate cutoff and attenuation frequencies, but *ignore the decimal points* because the component values are easily scaled by powers of ten. A 5-element Chebyshev design looks like a good choice because designs 20 through 22 show 20-dB frequencies of 2.73 and 2.77 MHz and cutoff frequencies of 1.44 to 1.66 MHz. In fact, those numbers are *too* close to our targets (27.7 MHz is only 1.1% under 28 MHz). Using 5% components, we would be lucky to get within 5% of the design targets. It's better to move each target value 10% or so to the safe side, which yields 20 dB at 25.2 MHz and f_{co} = 15.5 MHz. No 5-element design in the table can meet these criteria.

In the 7-element Chebyshev list, however, design 25 meets the needs. It has a maximum SWR of 1.099:1, which is acceptable.

FREQUENCY (MHz)

NO.	*F_{co}*	*3 dB*	*20 dB*	*40 dB*	*MAX SWR*	*C1,7 (pF)*	*L2,6 (µH)*	*C3,5 (pF)*	*L4 (µH)*
25	1.68	1.93	2.35	3.03	1.099	1500	6.58	3300	7.72

Scaling the filter is easy. We need only divide one of the frequencies listed into the desired frequency, round to the nearest power of ten and multiply all frequencies and divide all component values by the result: 28/2.35 = 11.91, say 10; which gives:

FREQUENCY (MHz)

NO.	*F_{co}*	*3 dB*	*20 dB*	*40 dB*	*MAX SWR*	*C1,7 (pF)*	*L2,6 (µH)*	*C3,5 (pF)*	*L4 (µH)*
25	16.8	19.3	23.5	30.3	1.099	150	0.658	330	0.772

In some cases, the filter terminating impedances may not be 50 Ω. Then we need to adjust the filter values to match the required impedance. All tabulated designs are easily scaled to impedance levels other than 50 Ω, while keeping the convenience of standard-value capacitors and the "scan mode" of design selection. If the desired new impedance level differs from 50 Ω by a factor that is some power of ten, the 50-Ω design is scaled by shifting the decimal points of the component values, that is multiplying or dividing by some power of ten. The other data remain unchanged. For example, if the impedance level is increased by ten or one hundred times (to 500 or 5000 Ω), the decimal point of the capacitor is shifted to the left (dividing) one or two places and the decimal point of the inductor is shifted to the right (multiplying) one or two places. With increasing impedance, capacitor values decrease and inductor values increase. The opposite is true when impedance decreases.

When the desired impedance level differs from the standard 50-Ω value by a factor that is not a power of ten, such as 1.2, 1.5 or 1.86, the search criteria to select the design number must be adjusted by that factor:

1. Calculate the impedance scaling ratio:

$$R = \frac{Z_x}{50} \qquad (1)$$

where Z_x is the desired new impedance level, in ohms.

2. Calculate the cutoff frequency (f_{50co}) of a "trial" 50-Ω filter,

$$f_{50co} = R \times f_{xco} \qquad (2)$$

where R is the impedance scaling ratio and f_{xco} is the desired cutoff frequency of the filter at the new impedance level.

3. Select a design from the SVC tables based on the calculated f_{50co}. The capacitor values of this design are taken directly, but the frequency and inductor values must be scaled to the new impedance level.

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How to Use the Standard Value Capacitor (SVC) Filter Tables

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4. Calculate the exact f_{xco} values, where

$$f_{xco} = \frac{f'50co}{R} \quad (3)$$

and f'_{50co} is the tabulated cutoff frequency of the selected design. Calculate the other frequencies of the design in the same way.

5. Calculate the inductor values for the new filter by multiplying the tabulated inductor values of the selected design by the square of the scaling ratio, R.

For example, assume that our 20-m low-pass filter were to be used in a 1000-Ω IF stage. This requires that we apply both methods, because a change from 50 to 1000 involves factors of 10 and 2 (50 × 2 × 10 = 1000). Therefore, we must first scale the desired frequencies by from 50 Ω to 100 Ω (50 × 2 = 100):

R = 100/50 = 2

f_{50co} = 2 × 15.5 = 31 MHz

f_{20dB} = 2 × 25.2 = 50.4 MHz

Select a filter based on these two values. Design 59 from the 7-element low-pass Chebyshev list looks good.

Scale all frequencies of the final design by dividing the tabulated frequencies impedance scaling ratio, 2:

f_{co} = 3.3/2 = 1.65

f_{20dB} = 4.81/2 = 2.405

The inductor values are scaled to 100 Ω by multiplying them by the square of the impedance ratio, where R = 2 and R^2 = 4.0:

L2,6 = 4.0 × 3.24 µH = 12.96 µH

L4 = 4.0 × 3.88 µH = 15.52 µH

The 100-Ω design is now impedance scaled to 1000 Ω by shifting the decimal points of the capacitor values to the left and the decimal points of the inductor values to the right. The final scaled component values for the 1000-Ω filter are:

C1,7 = 68 pF

C3,5 = 160 pF

L2,6 = 129.6 µH

L4 = 155.2 µH.

5-Element Chebyshev Low-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,5 (pF)	L2,4 (µH)	C3 (pF)
1	1.01	1.15	1.53	2.25	1.355	3600	10.8	6200
2	1.02	1.21	1.65	2.45	1.212	3000	10.7	5600
3	1.15	1.29	1.71	2.51	1.391	3300	9.49	5600
4	1.10	1.32	1.81	2.69	1.196	2700	9.88	5100
5	1.25	1.41	1.88	2.75	1.386	3000	8.67	5100
6	1.04	1.37	1.94	2.94	1.085	2200	9.82	4700
7	1.15	1.41	1.95	2.92	1.155	2400	9.37	4700
8	1.32	1.50	2.01	2.96	1.332	2700	8.29	4700
9	1.13	1.50	2.12	3.22	1.081	2000	9.00	4300
10	1.26	1.54	2.13	3.19	1.157	2200	8.56	4300
11	1.39	1.61	2.18	3.21	1.276	2400	7.88	4300
12	1.05	1.62	2.38	3.66	1.028	1600	8.35	3900
13	1.23	1.65	2.34	3.55	1.076	1800	8.19	3900
14	1.39	1.70	2.35	3.51	1.159	2000	7.75	3900
15	1.55	1.79	2.41	3.55	1.295	2200	7.05	3900
16	1.17	1.76	2.57	3.94	1.033	1500	7.70	3600
17	1.27	1.77	2.55	3.88	1.057	1600	7.64	3600
18	1.46	1.82	2.54	3.81	1.135	1800	7.28	3600
19	1.65	1.92	2.59	3.83	1.268	2000	6.64	3600
20	1.88	2.08	2.73	3.97	1.497	2200	5.70	3600
21	1.43	1.94	2.77	4.21	1.068	1500	6.96	3300
22	1.54	1.97	2.77	4.17	1.109	1600	6.79	3300
23	1.76	2.07	2.81	4.17	1.238	1800	6.21	3300
24	2.02	2.25	2.96	4.31	1.470	2000	5.31	3300
25	1.31	2.10	3.11	4.79	1.022	1200	6.43	3000
26	1.48	2.12	3.06	4.68	1.046	1300	6.39	3000
27	1.75	2.19	3.05	4.57	1.135	1500	6.07	3000
28	1.89	2.25	3.08	4.57	1.206	1600	5.77	3000
29	2.19	2.45	3.23	4.71	1.440	1800	4.92	3000
30	1.51	2.34	3.44	5.29	1.026	1100	5.78	2700
31	1.70	2.36	3.40	5.17	1.057	1200	5.73	2700
32	1.87	2.40	3.38	5.10	1.104	1300	5.57	2700
33	2.20	2.56	3.46	5.11	1.268	1500	4.98	2700
34	2.39	2.69	3.56	5.21	1.406	1600	4.53	2700
35	1.75	2.63	3.85	5.91	1.033	1000	5.14	2400
36	1.99	2.67	3.81	5.78	1.072	1100	5.05	2400
37	2.19	2.74	3.81	5.71	1.135	1200	4.85	2400
38	2.40	2.84	3.86	5.73	1.227	1300	4.55	2400
39	1.89	2.87	4.21	6.47	1.030	910	4.71	2200
40	2.14	2.91	4.16	6.31	1.068	1000	4.64	2200
41	2.39	2.99	4.16	6.23	1.135	1100	4.45	2200
42	2.64	3.11	4.22	6.25	1.238	1200	4.14	2200
43	2.93	3.29	4.36	6.39	1.398	1300	3.71	2200
44	2.05	3.16	4.64	7.13	1.028	820	4.28	2000
45	2.36	3.20	4.57	6.94	1.068	910	4.22	2000
46	2.63	3.28	4.57	6.86	1.135	1000	4.05	2000
47	2.93	3.43	4.65	6.89	1.251	1100	3.73	2000
48	3.29	3.67	4.85	7.07	1.440	1200	3.28	2000
49	2.34	3.51	5.14	7.88	1.033	750	3.85	1800
50	2.63	3.56	5.08	7.71	1.069	820	3.79	1800
51	2.96	3.66	5.09	7.62	1.145	910	3.61	1800
52	3.30	3.84	5.19	7.67	1.268	1000	3.32	1800
53	3.76	4.15	5.45	7.93	1.497	1100	2.85	1800
54	2.70	3.96	5.76	8.82	1.039	680	3.42	1600

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5-Element Chebyshev Low-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Continued from previous page.

Filter No.	Frequency (MHz) F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,5 (pF)	L2,4 (µH)	C3 (pF)
55	3.06	4.03	5.71	8.63	1.086	750	3.34	1600
56	3.38	4.14	5.73	8.57	1.159	820	3.18	1600
57	3.82	4.39	5.89	8.67	1.311	910	2.86	1600
58	2.77	4.21	6.18	9.48	1.030	620	3.21	1500
59	3.14	4.26	6.10	9.26	1.067	680	3.17	1500
60	3.51	4.38	6.10	9.14	1.135	750	3.03	1500
61	3.88	4.56	6.20	9.17	1.241	820	2.82	1500
62	4.46	4.95	6.51	9.48	1.473	910	2.41	1500
63	3.39	4.88	7.08	10.8	1.044	560	2.77	1300
64	3.84	4.98	7.02	10.6	1.097	620	2.70	1300
65	4.26	5.14	7.08	10.5	1.181	680	2.55	1300
66	4.79	5.46	7.29	10.7	1.341	750	2.28	1300
67	3.61	5.28	7.68	11.8	1.039	510	2.56	1200
68	4.06	5.36	7.61	11.5	1.083	560	2.51	1200
69	4.55	5.54	7.65	11.4	1.167	620	2.37	1200
70	5.07	5.84	7.84	11.5	1.304	680	2.16	1200
71	3.96	5.76	8.38	12.8	1.041	470	2.35	1100
72	4.39	5.84	8.31	12.6	1.079	510	2.31	1100
73	4.88	6.01	8.33	12.5	1.152	560	2.20	1100
74	5.50	6.34	8.54	12.6	1.293	620	1.99	1100
75	4.40	6.34	9.20	14.1	1.043	430	2.13	1000
76	4.91	6.45	9.13	13.8	1.087	470	2.09	1000
77	5.38	6.62	9.17	13.7	1.154	510	2.00	1000
78	6.00	6.95	9.37	13.8	1.282	560	1.83	1000
79	4.81	6.97	10.1	15.5	1.042	390	1.94	910
80	5.43	7.09	10.0	15.2	1 091	430	1.89	910
81	6.00	7.31	10.1	15.1	1.167	470	1.80	910
82	6.60	7.64	10.3	15.2	1.283	510	1.66	910
83	4.86	7.69	11.4	17.5	1.023	330	1.76	820
84	5.51	7.76	11.2	17.1	1.052	360	1.74	820
85	6.07	7.89	11.1	16.8	1.095	390	1.70	820
86	6.77	8.17	11.2	16.7	1.184	430	1.60	820
87	7.54	8.61	11.5	17.0	1.327	470	1.45	820
88	5.26	8.40	12.4	19.2	1.022	300	1.61	750
89	6.04	8.49	12.2	18.7	1.052	330	1.59	750
90	6.70	8.64	12.2	18.4	1.101	360	1.55	750
91	7.33	8.89	12.3	18.3	1.175	390	1.48	750
92	8.24	9.42	12.6	18.5	1.327	430	1.33	750
93	6.69	9.36	13.5	20.6	1.054	300	1.44	680
94	7.48	9.56	13.4	20.2	1.110	330	1.40	680
95	8.25	9.89	13.6	20.2	1.196	360	1.32	680
96	9.10	10.4	13.9	20.4	1.328	390	1.20	680
97	7.21	10.2	14.8	22.6	1.048	270	1.32	620
98	8.18	10.5	14.7	22.2	1.107	300	1.28	620
99	9.11	10.9	14.9	22.1	1.203	330	1.19	620
100	10.1	11.5	15.3	22.5	1.355	360	1.08	620
101	7.82	11.3	16.4	25.1	1.042	240	1.19	560
102	9.02	11.6	16.3	24.6	1.105	270	1.16	560
103	8.66	12.4	18.0	27.6	1.044	220	1.09	510
104	9.64	12.6	17.9	27.1	1.088	240	1.06	510
105	9.22	13.5	19.6	30.0	1.039	200	1.00	470
106	9.85	14.7	21.5	33.0	1.034	180	0.919	430

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5-Element Chebyshev Low-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

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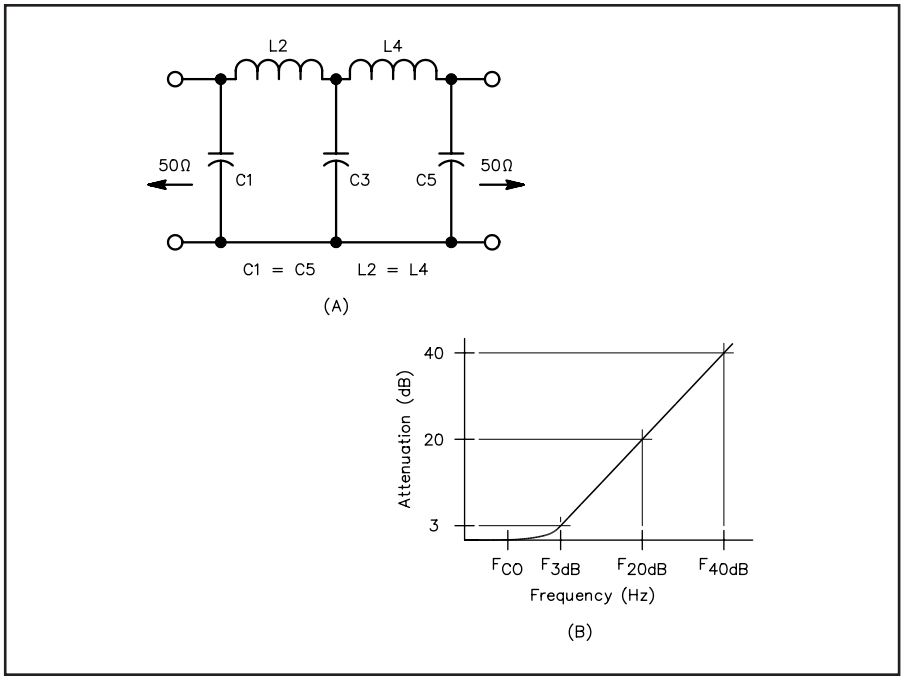

The schematic for a 5-element capacitor input/output Chebyshev low-pass filter is shown at A. At B is the typical attenuation response curve.

7-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,7 (pF)	L2,6 (µH)	C3,5 (pF)	L4 (µH)
1	1.02	1.10	1.31	1.65	1.254	3300	11.2	6200	12.6
2	1.04	1.16	1.40	1.79	1.142	2700	10.9	5600	12.6
3	1.13	1.23	1.45	1.84	1.264	3000	10.1	5600	11.3
4	1.05	1.23	1.51	1.96	1.071	2200	10.3	5100	12.3
5	1.12	1.26	1.53	1.96	1.123	2400	10.0	5100	11.7
6	1.23	1.34	1.59	2.01	1.247	2700	9.29	5100	10.4
7	1.03	1.30	1.63	2.15	1.030	1800	9.52	4700	11.9
8	1.12	1.33	1.64	2.13	1.064	2000	9.50	4700	11.4
9	1.21	1.37	1.66	2.13	1.119	2200	9.27	4700	10.8
10	1.29	1.42	1.70	2.16	1.200	2400	8.82	4700	10.0
11	1.10	1.41	1.79	2.36	1.023	1600	8.68	4300	11.0
12	1.21	1.45	1.79	2.33	1.058	1800	8.71	4300	10.5
13	1.31	1.49	1.81	2.33	1.114	2000	8.50	4300	9.91
14	1.42	1.56	1.86	2.36	1.202	2200	8.06	4300	9.14
15	1.54	1.65	1.93	2.43	1.336	2400	7.39	4300	8.18
16	1.25	1.57	1.97	2.59	1.031	1500	7.90	3900	9.85
17	1.32	1.59	1.97	2.57	1.050	1600	7.91	3900	9.62
18	1.44	1.64	1.99	2.56	1.109	1800	7.73	3900	9.04
19	1.57	1.72	2.05	2.60	1.205	2000	7.30	3900	8.27
20	1.44	1.73	2.14	2.78	1.056	1500	7.29	3600	8.82
21	1.52	1.76	2.15	2.78	1.086	1600	7.22	3600	8.54
22	1.66	1.84	2.20	2.81	1.176	1800	6.86	3600	7.83
23	1.83	1.96	2.30	2.90	1.327	2000	6.22	3600	6.90
24	1.51	1.86	2.32	3.05	1.037	1300	6.70	3300	8.27
25	1.68	1.93	2.35	3.03	1.099	1500	6.58	3300	7.72
26	1.77	1.98	2.38	3.05	1.147	1600	6.40	3300	7.37
27	1.96	2.11	2.49	3.14	1.294	1800	5.83	3300	6.50
28	1.56	2.02	2.56	3.38	1.021	1100	6.04	3000	7.68
29	1.68	2.05	2.56	3.35	1.042	1200	6.09	3000	7.47
30	1.79	2.09	2.57	3.33	1.073	1300	6.05	3000	7.21
31	1.99	2.20	2.64	3.37	1.176	1500	5.72	3000	6.52
32	2.11	2.28	2.70	3.42	1.257	1600	5.42	3000	6.08
33	1.75	2.25	2.84	3.75	1.023	1000	5.45	2700	6.89
34	1.89	2.29	2.84	3.71	1.048	1100	5.48	2700	6.68
35	2.02	2.34	2.86	3.70	1.086	1200	5.41	2700	6.40
36	2.15	2.41	2.90	3.72	1.141	1300	5.26	2700	6.06
37	2.44	2.61	3.07	3.86	1.327	1500	4.66	2700	5.18
38	2.01	2.54	3.20	4.21	1.027	910	4.86	2400	6.09
39	2.17	2.59	3.20	4.17	1.056	1000	4.86	2400	5.88
40	2.33	2.66	3.24	4.17	1.104	1100	4.77	2400	5.59
41	2.49	2.76	3.30	4.21	1.176	1200	4.57	2400	5.22
42	2.67	2.88	3.41	4.30	1.282	1300	4.27	2400	4.77
43	2.15	2.76	3.49	4.60	1.024	820	4.44	2200	5.61
44	2.35	2.82	3.49	4.55	1.053	910	4.46	2200	5.41
45	2.52	2.89	3.52	4.54	1.099	1000	4.38	2200	5.15
46	2.72	3.01	3.60	4.59	1.176	1100	4.19	2200	4.78
47	2.94	3.16	3.73	4.70	1.294	1200	3.88	2200	4.33
48	2.38	3.04	3.84	5.06	1.025	750	4.04	2000	5.09
49	2.57	3.09	3.84	5.01	1.050	820	4.06	2000	4.93
50	2.78	3.18	3.88	5.00	1.100	910	3.98	2000	4.68
51	2.99	3.31	3.96	5.05	1.176	1000	3.81	2000	4.35
52	3.26	3.50	4.12	5.19	1.308	1100	3.50	2000	3.89
53	2.67	3.38	4.26	5.61	1.027	680	3.64	1800	4.57
54	2.89	3.45	4.27	5.56	1.056	750	3.65	1800	4.41
55	3.09	3.54	4.31	5.55	1.100	820	3.59	1800	4.21

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7-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Continued from previous page.

Filter No.	Frequency (MHz) F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,7 (pF)	L2,6 (µH)	C3,5 (pF)	L4 (µH)
56	3.35	3.69	4.42	5.62	1.188	910	3.40	1800	3.87
57	3.65	3.92	4.60	5.80	1.327	1000	3.11	1800	3.45
58	3.07	3.82	4.80	6.30	1.033	620	3.24	1600	4.03
59	3.30	3.90	4.81	6.25	1.064	680	3.24	1600	3.88
60	3.55	4.02	4.87	6.26	1.120	750	3.15	1600	3.67
61	3.81	4.18	4.99	6.34	1.204	820	3.00	1600	3.39
62	3.16	4.05	5.12	6.75	1.024	560	3.03	1500	3.82
63	3.45	4.13	5.12	6.68	1.053	620	3.04	1500	3.69
64	3.69	4.24	5.17	6.66	1.097	680	2.99	1500	3.51
65	3.99	4.41	5.28	6.73	1.176	750	2.86	1500	3.26
66	4.31	4.64	5.48	6.91	1.297	820	2.64	1500	2.94
67	3.81	4.72	5.90	7.74	1.036	510	2.64	1300	3.26
68	4.10	4.82	5.93	7.69	1.070	560	2.62	1300	3.14
69	4.43	4.98	6.02	7.72	1.133	620	2.54	1300	2.94
70	4.78	5.21	6.19	7.85	1.230	680	2.39	1300	2.70
71	4.13	5.11	6.39	8.38	1.035	470	2.43	1200	3.01
72	4.40	5.20	6.41	8.33	1.064	510	2.43	1200	2.91
73	4.72	5.35	6.49	8.34	1.116	560	2.37	1200	2.76
74	5.12	5.60	6.67	8.48	1.214	620	2.23	1200	2.52
75	4.49	5.57	6.97	9.15	1.035	430	2.23	1100	2.76
76	4.82	5.68	7.00	9.09	1.066	470	2.22	1100	2.66
77	5.12	5.83	7.07	9.10	1.112	510	2.18	1100	2.54
78	5.52	6.07	7.24	9.21	1.196	560	2.07	1100	2.35
79	4.93	6.12	7.67	10.1	1.034	390	2.03	1000	2.51
80	5.33	6.26	7.70	10.0	1.069	430	2.02	1000	2.41
81	5.69	6.44	7.80	10.0	1.122	470	1.97	1000	2.29
82	6.08	6.68	7.97	10.1	1.198	510	1.88	1000	2.13
83	6.63	7.09	8.32	10.5	1.343	560	1.71	1000	1.89
84	5.48	6.75	8.43	11.0	1.038	360	1.85	910	2.28
85	5.84	6.87	8.46	11.0	1.068	390	1.84	910	2.20
86	6.28	7.09	8.58	11.0	1.126	430	1.79	910	2.07
87	6.75	7.39	8.80	11.2	1.213	470	1.69	910	1.91
88	5.68	7.39	9.37	12.4	1.020	300	1.65	820	2.10
89	6.17	7.52	9.36	12.2	1.043	330	1.66	820	2.04
90	6.60	7.68	9.41	12.2	1.079	360	1.65	820	1.96
91	7.01	7.89	9.53	12.2	1.131	390	1.61	820	1.86
92	7.59	8.27	9.82	12.5	1.233	430	1.51	820	1.70
93	6.72	8.21	10.2	13.4	1.042	300	1.52	750	1.87
94	7.23	8.40	10.3	13.3	1.080	330	1.51	750	1.79
95	7.72	8.66	10.4	13.4	1.138	360	1.46	750	1.69
96	8.24	9.00	10.7	13.6	1.222	390	1.39	750	1.57
97	7.36	9.04	11.3	14.8	1.039	270	1.38	680	1.70
98	7.98	9.27	11.4	14.7	1.082	300	1.37	680	1.62
99	8.58	9.59	11.6	14.8	1.148	330	1.32	680	1.52
100	9.23	10.0	11.9	15.1	1.247	360	1.24	680	1.39
101	7.91	9.86	12.4	16.2	1.032	240	1.26	620	1.56
102	8.67	10.1	12.4	16.1	1.075	270	1.25	620	1.49
103	9.39	10.5	12.7	16.2	1.145	300	1.20	620	1.39
104	8.86	11.0	13.7	18.0	1.036	220	1.14	560	1.40
105	9.49	11.2	13.8	17.8	1.068	240	1.13	560	1.35
106	9.72	12.0	15.0	19.7	1.036	200	1.03	510	1.28

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7-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

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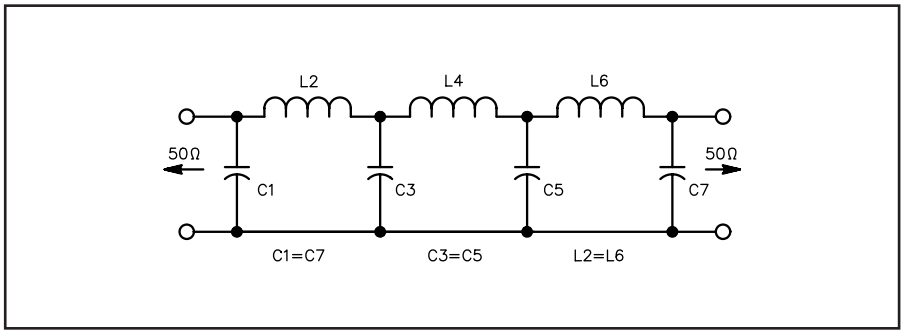

The schematic for a 7-element Chebyshev low-pass filter. See page 5 for the attenuation response curve.

5-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, L-In/Out for Standard-Value L and C

Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	L1,5 (µH)	C2,4 (pF)	L3 (µH)
1	0.744	1.15	1.69	2.60	1.027	5.60	4700	13.7
2	0.901	1.26	1.81	2.76	1.055	5.60	4300	12.7
3	1.06	1.38	1.94	2.93	1.096	5.60	3900	11.8
4	1.19	1.47	2.05	3.07	1.138	5.60	3600	11.2
5	1.32	1.58	2.17	3.23	1.192	5.60	3300	10.6
6	0.911	1.39	2.03	3.12	1.030	4.70	3900	11.4
7	1.08	1.50	2.16	3.29	1.056	4.70	3600	10.6
8	1.25	1.63	2.30	3.48	1.092	4.70	3300	9.92
9	1.42	1.77	2.46	3.68	1.142	4.70	3000	9.32
10	1.61	1.92	2.63	3.90	1.209	4.70	2700	8.79
11	1.05	1.64	2.41	3.72	1.025	3.90	3300	9.63
12	1.29	1.80	2.60	3.96	1.054	3.90	3000	8.83
13	1.54	1.99	2.80	4.22	1.099	3.90	2700	8.15
14	1.80	2.19	3.03	4.53	1.164	3.90	2400	7.57
15	1.99	2.35	3.20	4.75	1.222	3.90	2200	7.23
16	1.34	2.00	2.93	4.49	1.034	3.30	2700	7.89
17	1.68	2.25	3.20	4.84	1.077	3.30	2400	7.15
18	1.92	2.43	3.40	5.11	1.118	3.30	2200	6.73
19	2.16	2.63	3.62	5.40	1.174	3.30	2000	6.35
20	1.65	2.46	3.59	5.51	1.035	2.70	2200	6.43
21	1.99	2.70	3.86	5.85	1.069	2.70	2000	5.93
22	2.34	2.97	4.15	6.24	1.118	2.70	1800	5.50
23	2.71	3.27	4.49	6.68	1.188	2.70	1600	5.13
24	2.92	3.43	4.67	6.92	1.233	2.70	1500	4.97
25	2.01	3.01	4.39	6.74	1.034	2.20	1800	5.26
26	2.52	3.37	4.80	7.27	1.077	2.20	1600	4.76
27	2.78	3.57	5.02	7.56	1.107	2.20	1500	4.55
28	3.34	4.02	5.52	8.21	1.190	2.20	1300	4.18
29	2.36	3.61	5.29	8.14	1.029	1.80	1500	4.38
30	3.12	4.14	5.89	8.92	1.080	1.80	1300	3.88
31	3.51	4.45	6.23	9.36	1.118	1.80	1200	3.67
32	3.93	4.78	6.60	9.85	1.169	1.80	1100	3.48
33	4.37	5.15	7.01	10.4	1.233	1.80	1000	3.31
34	3.10	4.51	6.56	10.0	1.041	1.50	1200	3.51
35	3.65	4.90	6.99	10.6	1.073	1.50	1100	3.27
36	4.21	5.34	7.47	11.2	1.118	1.50	1000	3.06
37	4.75	5.77	7.95	11.9	1.173	1.50	910	2.89
38	3.53	5.41	7.94	12.2	1.029	1.20	1000	2.92
39	4.30	5.94	8.53	13.0	1.060	1.20	910	2.69
40	5.09	6.53	9.18	13.8	1.106	1.20	820	2.49
41	5.73	7.04	9.75	14.6	1.155	1.20	750	2.35
42	6.42	7.61	10.4	15.4	1.219	1.20	680	2.23
43	4.40	6.60	9.65	14.8	1.033	1.00	820	2.40
44	5.27	7.20	10.3	15.7	1.064	1.00	750	2.22
45	6.15	7.87	11.1	16.7	1.108	1.00	680	2.07
46	6.95	8.51	11.8	17.6	1.160	1.00	620	1.95
47	7.80	9.22	12.6	18.6	1.227	1.00	560	1.85
48	5.23	7.96	11.7	17.9	1.030	0.82	680	1.99
49	6.33	8.72	12.5	19.0	1.061	0.82	620	1.83
50	7.45	9.56	13.4	20.3	1.106	0.82	560	1.70
51	8.44	10.3	14.3	21.4	1.158	0.82	510	1.60
52	9.28	11.0	15.1	22.4	1.211	0.82	470	1.53
53	6.41	9.66	14.1	21.7	1.032	0.68	560	1.64
54	7.75	10.6	15.2	23.1	1.064	0.68	510	1.51
55	8.83	11.4	16.1	24.3	1.100	0.68	470	1.42
56	9.97	12.3	17.1	25.6	1.148	0.68	430	1.34

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5-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, L-In/Out for Standard-Value L and C

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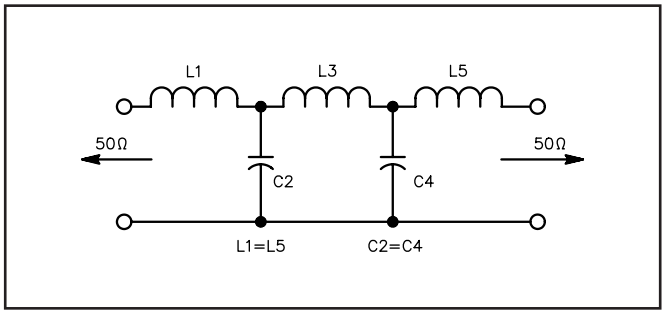
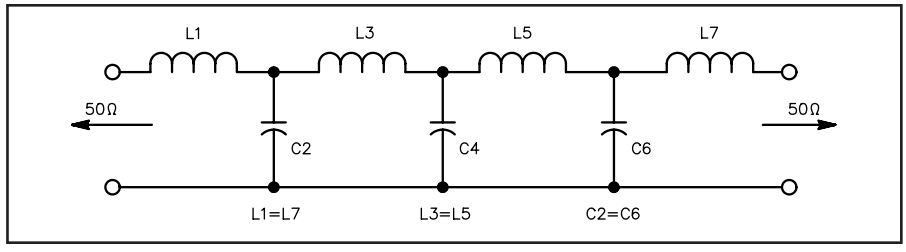


The schematic for a 5-element inductor input/output Chebyshev low-pass filter. See page 5 for the attenuation response curve.

7-Element Chebyshev Low-Pass Filter Designs—50-Ohm Impedance, L-In/Out for Standard-Value L and C

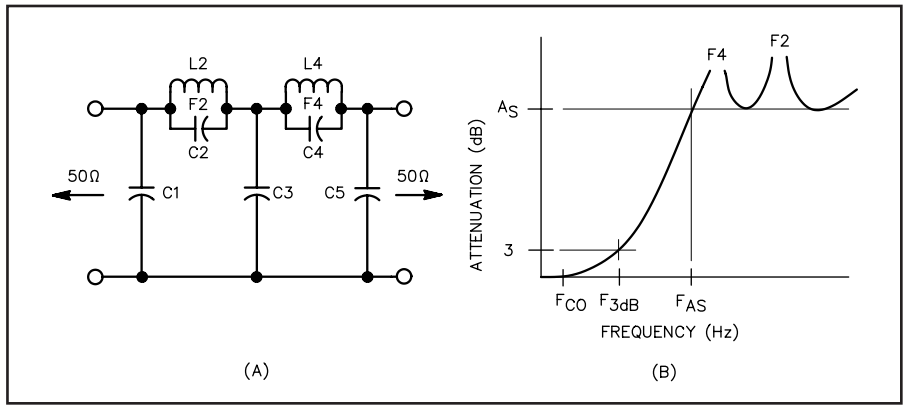
Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	L1,7 (µH)	C2,6 (pF)	L3,5 (µH)	C4 (pF)
1	1.01	1.18	1.44	1.87	1.081	5.89	4300	13.4	5100
2	1.09	1.29	1.60	2.08	1.059	5.06	3900	12.0	4700
3	1.03	1.09	1.26	1.58	1.480	10.1	4300	17.1	4700
4	1.20	1.40	1.73	2.24	1.071	4.81	3600	11.2	4300
5	1.16	1.23	1.44	1.81	1.383	8.34	3900	14.6	4300
6	1.33	1.54	1.88	2.43	1.087	4.58	3300	10.3	3900
7	1.42	1.68	2.07	2.70	1.064	3.95	3000	9.27	3600
8	1.34	1.41	1.63	2.04	1.506	7.98	3300	13.4	3600
9	1.53	1.85	2.31	3.02	1.045	3.36	2700	8.32	3300
10	1.50	1.59	1.86	2.33	1.406	6.57	3000	11.4	3300
11	1.63	2.06	2.59	3.41	1.029	2.83	2400	7.41	3000
12	1.69	1.81	2.13	2.68	1.317	5.36	2700	9.70	3000
13	1.86	2.27	2.83	3.70	1.042	2.71	2200	6.78	2700
14	1.91	2.07	2.46	3.12	1.238	4.31	2400	8.19	2700
15	2.14	2.52	3.11	4.04	1.064	2.63	2000	6.18	2400
16	2.01	2.11	2.45	3.06	1.506	5.32	2200	8.91	2400
17	2.29	2.78	3.46	4.52	1.045	2.24	1800	5.54	2200
18	2.25	2.39	2.79	3.49	1.406	4.38	2000	7.61	2200
19	2.45	3.09	3.88	5.11	1.029	1.89	1600	4.94	2000
20	2.53	2.71	3.19	4.02	1.317	3.57	1800	6.47	2000
21	2.85	3.37	4.15	5.39	1.064	1.97	1500	4.64	1800
22	2.86	3.11	3.69	4.68	1.238	2.88	1600	5.46	1800
23	3.13	3.84	4.79	6.27	1.039	1.59	1300	4.00	1600
24	3.27	4.12	5.18	6.81	1.029	1.41	1200	3.70	1500
25	3.47	3.90	4.70	6.02	1.140	2.01	1300	4.17	1500
26	3.99	4.61	5.64	7.28	1.087	1.53	1100	3.43	1300
27	4.27	5.05	6.22	8.09	1.064	1.32	1000	3.09	1200
28	4.01	4.22	4.90	6.11	1.506	2.66	1100	4.45	1200
29	4.63	5.53	6.85	8.91	1.056	1.17	910	2.81	1100
30	4.49	4.77	5.57	6.98	1.406	2.19	1000	3.81	1100
31	5.05	6.11	7.60	9.92	1.047	1.03	820	2.53	1000
32	4.93	5.23	6.10	7.64	1.416	2.02	910	3.49	1000
33	5.58	6.70	8.31	10.8	1.052	0.954	750	2.31	910
34	5.54	5.94	6.99	8.80	1.326	1.65	820	2.97	910
35	6.23	7.41	9.16	11.9	1.059	0.881	680	2.10	820
36	5.92	6.24	7.26	9.06	1.476	1.76	750	2.98	820
37	6.79	8.12	10.0	13.1	1.055	0.796	620	1.91	750
38	6.64	7.07	8.27	10.4	1.379	1.45	680	2.54	750
39	7.46	8.97	11.1	14.5	1.051	0.711	560	1.73	680
40	7.21	7.63	8.89	11.1	1.438	1.40	620	2.41	680
41	8.18	9.85	12.2	15.9	1.050	0.645	510	1.57	620
42	8.10	8.66	10.2	12.8	1.345	1.15	560	2.05	620
43	9.21	10.8	13.2	17.1	1.074	0.633	470	1.46	560
44	8.78	9.31	10.9	13.6	1.425	1.14	510	1.96	560
45	10.1	11.8	14.4	18.7	1.081	0.589	430	1.34	510



The schematic for a 7-element inductor input/output Chebyshev low-pass filter. See page 5 for the attenuation response curve.

5-Branch Elliptic Low-Pass Filter Designs—
50-Ohm Impedance, Standard E12 Capacitor Values for C1, C3 and C5

Filter No.	F_{co}	F_{3dB} (MHz)	F_{As}	A_s (dB)	Max. SWR	C1	C3	C5 (pF)	C2	C4	L2 (µH)	L4	F2 (MHz)	F4
1	0.795	0.989	1.57	47.4	1.092	2700	5600	2200	324	937	12.1	10.1	2.54	1.64
2	1.06	1.20	1.77	46.2	1.234	2700	4700	2200	341	982	9.36	7.56	2.82	1.85
3	1.47	1.57	2.15	45.4	1.586	2700	3900	2200	364	1045	6.32	4.88	3.32	2.23
4	0.929	1.18	1.91	48.0	1.077	2200	4700	1800	257	743	10.2	8.59	3.11	1.99
5	1.27	1.45	2.17	46.7	1.215	2200	3900	1800	271	779	7.85	6.39	3.45	2.26
6	1.69	1.82	2.54	45.9	1.489	2200	3300	1800	287	821	5.64	4.42	3.96	2.64
7	1.12	1.44	2.41	49.8	1.071	1800	3900	1500	192	549	8.45	7.25	3.95	2.52
8	1.49	1.73	2.70	48.8	1.183	1800	3300	1500	200	570	6.75	5.62	4.33	2.81
9	2.11	2.27	3.27	47.8	1.506	1800	2700	1500	213	604	4.55	3.64	5.12	3.40
10	1.28	1.66	2.63	46.3	1.064	1500	3300	1200	192	561	7.20	6.00	4.28	2.74
11	1.79	2.06	2.99	44.8	1.195	1500	2700	1200	204	592	5.52	4.42	4.75	3.11
12	2.52	2.70	3.63	43.8	1.525	1500	2200	1200	220	636	3.71	2.82	5.58	3.76
13	1.56	2.08	3.55	50.1	1.055	1200	2700	1000	127	363	5.88	5.07	5.83	3.71
14	2.23	2.59	4.04	48.8	1.183	1200	2200	1000	133	380	4.50	3.75	6.50	4.22
15	3.17	3.41	4.90	47.8	1.506	1200	1800	1000	142	402	3.03	2.42	7.68	5.10
16	1.94	2.52	4.15	48.4	1.064	1000	2200	820	115	331	4.79	4.06	6.78	4.34
17	2.73	3.14	4.73	47.0	1.199	1000	1800	820	121	348	3.66	2.99	7.56	4.93
18	3.73	4.02	5.63	46.2	1.491	1000	1500	820	129	368	2.56	2.01	8.76	5.85
19	2.39	3.11	5.20	49.4	1.065	820	1800	680	89.3	256	3.91	3.35	8.51	5.44
20	3.26	3.79	5.85	48.2	1.185	820	1500	680	93.6	267	3.07	2.54	9.39	6.10
21	4.83	5.17	7.30	47.2	1.569	820	1200	680	100	286	1.95	1.54	11.4	7.58
22	2.85	3.71	6.15	48.8	1.063	680	1500	560	76.6	220	3.26	2.78	10.1	6.43
23	4.16	4.74	7.14	47.3	1.221	680	1200	560	81.3	233	2.40	1.97	11.4	7.44
24	5.72	6.13	8.58	46.5	1.547	680	1000	560	86.3	246	1.65	1.30	13.3	8.91
25	3.67	4.69	7.95	50.5	1.076	560	1200	470	57.6	164	2.59	2.23	13.0	8.31
26	5.02	5.77	9.01	49.4	1.212	560	1000	470	60.3	171	2.01	1.68	14.5	9.40
27	7.18	7.68	11.1	48.6	1.582	560	820	470	64.1	181	1.32	1.06	17.3	11.5
28	4.40	5.60	9.24	49.3	1.079	470	1000	390	51.4	147	2.16	1.84	15.1	9.66
29	6.17	7.01	10.6	48.0	1.236	470	820	390	54.2	155	1.63	1.34	17.0	11.1
30	8.63	9.20	12.9	47.3	1.604	470	680	390	57.6	164	1.09	0.857	20.1	13.4
31	5.47	6.91	11.8	51.3	1.086	390	820	330	38.5	109	1.76	1.52	19.3	12.3
32	7.55	8.59	13.5	50.2	1.242	390	680	330	40.4	114	1.34	1.12	21.7	14.1
33	10.9	11.5	16.8	49.5	1.659	390	560	330	42.8	120	0.862	0.695	26.2	17.4
34	6.59	8.17	13.0	47.7	1.096	330	680	270	39.0	112	1.46	1.22	21.1	13.6
35	9.10	10.2	15.0	46.5	1.267	330	560	270	41.2	118	1.09	0.881	23.7	15.6
36	12.4	13.2	18.1	45.8	1.635	330	470	270	43.9	125	0.741	0.573	27.9	18.8



The schematic for a 5-branch elliptic low-pass filter is shown at A. At B is the typical attenuation response curve.

5-Element Chebyshev High-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Filter	—— Frequency (MHz) ——				Max	C1,5	L2,4	C3
No.	F_{co}	3 dB	20 dB	40 dB	SWR	(pF)	(µH)	(pF)
1	1.04	0.726	0.501	0.328	1.044	5100	6.45	2200
2	1.04	0.788	0.554	0.366	1.081	4300	5.97	2000
3	1.17	0.800	0.550	0.359	1.039	4700	5.85	2000
4	1.07	0.857	0.615	0.410	1.135	3600	5.56	1800
5	1.17	0.877	0.616	0.406	1.076	3900	5.36	1800
6	1.33	0.890	0.609	0.397	1.034	4300	5.26	1800
7	1.12	0.938	0.686	0.461	1.206	3000	5.20	1600
8	1.25	0.974	0.693	0.461	1.109	3300	4.86	1600
9	1.38	0.994	0.691	0.454	1.057	3600	4.71	1600
10	1.54	1.00	0.683	0.444	1.028	3900	4.67	1600
11	1.14	0.978	0.723	0.490	1.268	2700	5.09	1500
12	1.28	1.03	0.738	0.492	1.135	3000	4.64	1500
13	1.43	1.06	0.738	0.486	1.068	3300	4.44	1500
14	1.61	1.07	0.730	0.476	1.033	3600	4.38	1500
15	1.21	1.08	0.812	0.555	1.398	2200	4.82	1300
16	1.35	1.14	0.841	0.567	1.227	2400	4.29	1300
17	1.55	1.20	0.853	0.566	1.104	2700	3.94	1300
18	1.75	1.23	0.848	0.555	1.046	3000	3.81	1300
19	1.28	1.15	0.871	0.597	1.440	2000	4.57	1200
20	1.45	1.24	0.909	0.614	1.238	2200	3.99	1200
21	1.60	1.29	0.923	0.616	1.135	2400	3.71	1200
22	1.84	1.32	0.921	0.605	1.057	2700	3.54	1200
23	2.14	1.34	0.906	0.588	1.022	3000	3.50	1200
24	1.57	1.34	0.989	0.669	1.251	2000	3.69	1100
25	1.75	1.40	1.01	0.672	1.135	2200	3.40	1100
26	1.93	1.44	1.01	0.664	1.072	2400	3.27	1100
27	2.27	1.46	0.992	0.645	1.026	2700	3.21	1100
28	1.71	1.47	1.08	0.734	1.268	1800	3.39	1000
29	1.93	1.54	1.11	0.739	1.135	2000	3.09	1000
30	2.15	1.58	1.11	0.730	1.068	2200	2.96	1000
31	2.41	1.60	1.10	0.714	1.033	2400	2.92	1000
32	1.66	1.50	1.14	0.783	1.473	1500	3.54	910
33	1.82	1.59	1.18	0.803	1.311	1600	3.18	910
34	2.09	1.69	1.22	0.812	1.145	1800	2.83	910
35	2.36	1.74	1.22	0.802	1.068	2000	2.70	910
36	2.68	1.76	1.20	0.783	1.030	2200	2.66	910
37	2.12	1.81	1.33	0.898	1.241	1500	2.73	820
38	2.28	1.86	1.35	0.902	1.159	1600	2.58	820
39	2.61	1.93	1.35	0.890	1.069	1800	2.43	820
40	3.01	1.96	1.33	0.866	1.028	2000	2.39	820
41	2.17	1.90	1.42	0.970	1.341	1300	2.67	750
42	2.57	2.06	1.48	0.985	1.135	1500	2.32	750
43	2.76	2.10	1.48	0.978	1.086	1600	2.25	750
44	3.21	2.14	1.46	0.952	1.033	1800	2.19	750
45	2.45	2.13	1.58	1.08	1.304	1200	2.36	680
46	2.69	2.23	1.62	1.09	1.181	1300	2.17	680
47	3.17	2.33	1.63	1.07	1.067	1500	2.01	680
48	3.44	2.35	1.62	1.06	1.039	1600	1.99	680
49	2.70	2.34	1.74	1.18	1.293	1100	2.14	620
50	2.99	2.46	1.78	1.19	1.167	1200	1.96	620
51	3.28	2.53	1.79	1.19	1.097	1300	1.87	620
52	3.93	2.59	1.76	1.15	1.030	1500	1.81	620
53	3.02	2.60	1.93	1.31	1.282	1000	1.92	560
54	3.37	2.74	1.97	1.32	1.152	1100	1.75	560

Continued on next page.

5-Element Chebyshev High-Pass Filter Designs—
50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Continued from previous page.

Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,5 (pF)	L2,4 (µH)	C3 (pF)
55	3.72	2.81	1.98	1.31	1.083	1200	1.67	560
56	4.10	2.85	1.97	1.29	1.044	1300	1.64	560
57	3.31	2.86	2.12	1.44	1.283	910	1.75	510
58	3.69	3.00	2.17	1.45	1.154	1000	1.60	510
59	4.11	3.09	2.17	1.44	1.079	1100	1.52	510
60	4.59	3.14	2.15	1.41	1.039	1200	1.49	510
61	3.49	3.05	2.28	1.55	1.327	820	1.66	470
62	3.95	3.24	2.35	1.57	1.167	910	1.49	470
63	4.39	3.34	2.36	1.56	1.087	1000	1.41	470
64	4.94	3.40	2.34	1.53	1.041	1100	1.38	470
65	3.81	3.34	2.49	1.70	1.327	750	1.52	430
66	4.24	3.52	2.56	1.72	1.184	820	1.38	430
67	4.77	3.65	2.58	1.71	1.091	910	1.29	430
68	5.36	3.72	2.56	1.68	1.043	1000	1.26	430
69	4.20	3.68	2.75	1.87	1.328	680	1.38	390
70	4.72	3.89	2.83	1.90	1.175	750	1.24	390
71	5.22	4.02	2.84	1.88	1.095	820	1.17	390
72	5.93	4.10	2.82	1.85	1.042	910	1.14	390
73	4.48	3.95	2.96	2.02	1.355	620	1.30	360
74	5.01	4.18	3.05	2.05	1.196	680	1.16	360
75	5.60	4.34	3.08	2.04	1.101	750	1.09	360
76	6.23	4.42	3.07	2.01	1.052	820	1.06	360
77	4.79	4.25	3.20	2.19	1.391	560	1.22	330
78	5.44	4.55	3.33	2.24	1.203	620	1.07	330
79	6.03	4.72	3.36	2.23	1.110	680	1.00	330
80	6.77	4.82	3.35	2.20	1.052	750	0.970	330
81	7.70	4.87	3.30	2.14	1.023	820	0.962	330
82	5.28	4.68	3.53	2.41	1.386	510	1.10	300
83	5.94	4.99	3.65	2.46	1.212	560	0.978	300
84	6.66	5.20	3.70	2.46	1.107	620	0.910	300
85	7.43	5.31	3.68	2.42	1.054	680	0.882	300
86	8.56	5.36	3.62	2.35	1.022	750	0.875	300
87	6.05	5.31	3.97	2.70	1.332	470	0.956	270
88	6.69	5.58	4.07	2.74	1.196	510	0.870	270
89	7.43	5.78	4.11	2.73	1.105	560	0.817	270
90	8.39	5.91	4.08	2.68	1.048	620	0.792	270
91	7.07	6.09	4.51	3.06	1.276	430	0.818	240
92	7.84	6.38	4.61	3.08	1.155	470	0.752	240
93	8.59	6.55	4.62	3.06	1.088	510	0.719	240
94	9.64	6.66	4.58	3.00	1.042	560	0.702	240
95	7.61	6.60	4.90	3.33	1.295	390	0.760	220
96	8.53	6.95	5.02	3.36	1.157	430	0.690	220
97	9.43	7.15	5.04	3.33	1.085	470	0.658	220
98	10.4	7.26	5.01	3.28	1.044	510	0.644	220
99	7.58	6.83	5.19	3.56	1.470	330	0.776	200
100	8.53	7.33	5.42	3.67	1.268	360	0.678	200
101	9.36	7.64	5.52	3.70	1.159	390	0.628	200
102	10.4	7.88	5.54	3.66	1.081	430	0.596	200
103	8.55	7.67	5.81	3.98	1.440	300	0.685	180
104	9.69	8.24	6.06	4.09	1.238	330	0.597	180
105	10.7	8.57	6.15	4.10	1.135	360	0.556	180
106	9.80	8.73	6.58	4.50	1.406	270	0.595	160

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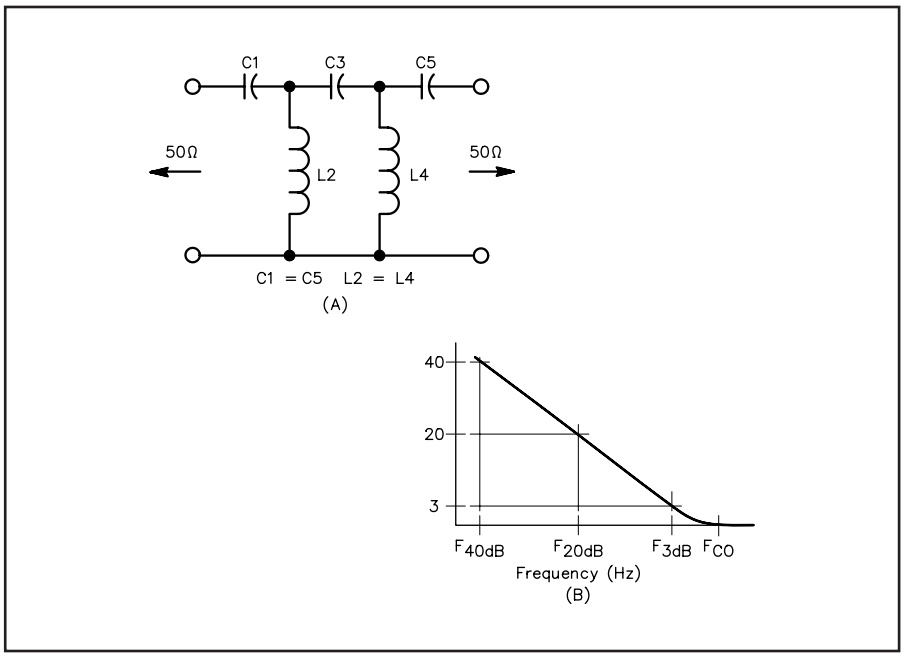
5-Element Chebyshev High-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Continued from previous page.



The schematic for a 5-element capacitor input/output Chebyshev high-pass filter is shown at A. At B is the typical attenuation response curve.

7-Element Chebyshev High-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Filter	—— Frequency (MHz) ——				Max	C1,7	L2,6	C3,5	L4
No.	F_{co}	3 dB	20 dB	40 dB	SWR	(pF)	(µH)	(pF)	(µH)
1	1.02	0.826	0.660	0.504	1.036	5100	6.16	2000	4.98
2	1.00	0.880	0.724	0.563	1.109	3900	5.67	1800	4.86
3	1.08	0.905	0.732	0.563	1.058	4300	5.55	1800	4.60
4	1.16	0.922	0.734	0.558	1.030	4700	5.55	1800	4.45
5	1.00	0.924	0.780	0.617	1.257	3000	5.53	1600	4.93
6	1.09	0.971	0.806	0.630	1.147	3300	5.15	1600	4.48
7	1.16	1.00	0.819	0.634	1.086	3600	4.99	1600	4.22
8	1.23	1.02	0.824	0.632	1.050	3900	4.93	1600	4.05
9	1.34	1.04	0.825	0.625	1.023	4300	4.95	1600	3.92
10	1.03	0.958	0.815	0.648	1.327	2700	5.43	1500	4.89
11	1.13	1.02	0.853	0.669	1.176	3000	4.92	1500	4.31
12	1.22	1.06	0.871	0.676	1.099	3300	4.70	1500	4.01
13	1.30	1.09	0.879	0.675	1.056	3600	4.63	1500	3.83
14	1.39	1.11	0.880	0.670	1.031	3900	4.63	1500	3.71
15	1.22	1.13	0.954	0.755	1.282	2400	4.57	1300	4.09
16	1.34	1.20	0.994	0.776	1.141	2700	4.17	1300	3.62
17	1.45	1.24	1.01	0.780	1.073	3000	4.03	1300	3.38
18	1.57	1.27	1.02	0.775	1.037	3300	4.00	1300	3.24
19	1.31	1.21	1.03	0.816	1.294	2200	4.25	1200	3.81
20	1.41	1.28	1.07	0.836	1.176	2400	3.94	1200	3.45
21	1.55	1.34	1.09	0.845	1.086	2700	3.74	1200	3.16
22	1.68	1.37	1.10	0.841	1.042	3000	3.70	1200	3.01
23	1.41	1.32	1.12	0.887	1.308	2000	3.93	1100	3.53
24	1.54	1.39	1.16	0.912	1.176	2200	3.61	1100	3.16
25	1.65	1.44	1.19	0.921	1.104	2400	3.46	1100	2.95
26	1.80	1.49	1.20	0.919	1.048	2700	3.39	1100	2.78
27	1.97	1.52	1.20	0.907	1.021	3000	3.41	1100	2.68
28	1.54	1.44	1.22	0.971	1.327	1800	3.62	1000	3.26
29	1.70	1.53	1.28	1.00	1.176	2000	3.28	1000	2.87
30	1.82	1.59	1.31	1.01	1.099	2200	3.14	1000	2.67
31	1.95	1.63	1.32	1.01	1.056	2400	3.08	1000	2.55
32	2.15	1.67	1.32	1.00	1.023	2700	3.10	1000	2.45
33	1.85	1.67	1.40	1.10	1.188	1800	3.01	910	2.64
34	2.00	1.75	1.44	1.11	1.100	2000	2.85	910	2.43
35	2.15	1.80	1.45	1.11	1.053	2200	2.81	910	2.31
36	2.31	1.83	1.45	1.10	1.027	2400	2.81	910	2.24
37	1.91	1.77	1.50	1.19	1.297	1500	2.91	820	2.61
38	2.03	1.85	1.55	1.22	1.204	1600	2.74	820	2.42
39	2.22	1.94	1.59	1.24	1.100	1800	2.57	820	2.19
40	2.41	2.00	1.61	1.23	1.050	2000	2.53	820	2.08
41	2.61	2.03	1.61	1.22	1.024	2200	2.54	820	2.01
42	2.26	2.04	1.71	1.34	1.176	1500	2.46	750	2.16
43	2.38	2.10	1.73	1.35	1.120	1600	2.38	750	2.04
44	2.60	2.17	1.76	1.35	1.056	1800	2.31	750	1.91
45	2.83	2.22	1.76	1.34	1.025	2000	2.32	750	1.84
46	2.40	2.20	1.85	1.46	1.230	1300	2.31	680	2.05
47	2.69	2.34	1.92	1.49	1.097	1500	2.13	680	1.81
48	2.82	2.39	1.94	1.49	1.064	1600	2.10	680	1.75
49	3.11	2.45	1.94	1.47	1.027	1800	2.10	680	1.67
50	2.66	2.43	2.04	1.61	1.214	1200	2.08	620	1.84
51	2.84	2.52	2.09	1.63	1.133	1300	1.98	620	1.71
52	3.16	2.64	2.13	1.63	1.053	1500	1.91	620	1.58
53	3.33	2.67	2.13	1.62	1.033	1600	1.91	620	1.54
54	2.73	2.55	2.17	1.73	1.343	1000	2.05	560	1.85

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7-Element Chebyshev High-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

Continued from previous page.

Filter No.	—— Frequency (MHz) —— F_{co}	3 dB	20 dB	40 dB	Max SWR	C1,7 (pF)	L2,6 (µH)	C3,5 (pF)	L4 (µH)
55	2.98	2.71	2.27	1.79	1.196	1100	1.86	560	1.64
56	3.19	2.82	2.32	1.81	1.116	1200	1.77	560	1.52
57	3.39	2.89	2.35	1.81	1.070	1300	1.73	560	1.45
58	3.81	2.98	2.36	1.79	1.024	1500	1.73	560	1.37
59	3.27	2.97	2.49	1.96	1.198	1000	1.70	510	1.49
60	3.53	3.10	2.55	1.99	1.112	1100	1.61	510	1.38
61	3.76	3.18	2.58	1.99	1.064	1200	1.58	510	1.31
62	4.01	3.24	2.59	1.98	1.036	1300	1.57	510	1.27
63	3.51	3.21	2.69	2.12	1.213	910	1.58	470	1.40
64	3.79	3.35	2.76	2.15	1.122	1000	1.49	470	1.28
65	4.07	3.45	2.80	2.16	1.066	1100	1.45	470	1.21
66	4.35	3.52	2.81	2.14	1.035	1200	1.45	470	1.17
67	3.79	3.47	2.93	2.31	1.233	820	1.46	430	1.30
68	4.12	3.65	3.02	2.35	1.126	910	1.37	430	1.18
69	4.42	3.76	3.06	2.36	1.069	1000	1.33	430	1.11
70	4.77	3.85	3.07	2.34	1.035	1100	1.33	430	1.07
71	4.20	3.85	3.24	2.55	1.222	750	1.32	390	1.17
72	4.52	4.02	3.32	2.59	1.131	820	1.24	390	1.07
73	4.89	4.15	3.37	2.60	1.068	910	1.21	390	1.01
74	5.27	4.24	3.39	2.58	1.034	1000	1.20	390	0.969
75	4.48	4.13	3.48	2.75	1.247	680	1.24	360	1.10
76	4.86	4.33	3.59	2.80	1.138	750	1.15	360	1.00
77	5.20	4.47	3.65	2.82	1.079	820	1.12	360	0.942
78	5.64	4.58	3.67	2.80	1.038	910	1.11	360	0.899
79	4.87	4.49	3.79	2.99	1.254	620	1.14	330	1.01
80	5.26	4.71	3.91	3.05	1.148	680	1.06	330	0.924
81	5.67	4.87	3.98	3.07	1.080	750	1.03	330	0.864
82	6.07	4.98	4.00	3.06	1.043	820	1.02	330	0.829
83	5.32	4.91	4.15	3.28	1.264	560	1.04	300	0.930
84	5.80	5.18	4.30	3.36	1.145	620	0.965	300	0.838
85	6.22	5.36	4.37	3.38	1.082	680	0.933	300	0.787
86	6.71	5.49	4.40	3.36	1.042	750	0.923	300	0.752
87	7.25	5.58	4.40	3.33	1.020	820	0.931	300	0.731
88	5.98	5.50	4.64	3.66	1.247	510	0.926	270	0.824
89	6.46	5.77	4.78	3.74	1.142	560	0.867	270	0.752
90	6.98	5.97	4.87	3.76	1.075	620	0.837	270	0.703
91	7.50	6.11	4.89	3.74	1.039	680	0.831	270	0.675
92	6.39	5.97	5.08	4.04	1.336	430	0.873	240	0.787
93	6.94	6.32	5.29	4.16	1.200	470	0.798	240	0.704
94	7.41	6.55	5.41	4.21	1.123	510	0.762	240	0.656
95	7.95	6.75	5.48	4.22	1.068	560	0.742	240	0.620
96	8.61	6.90	5.50	4.19	1.032	620	0.740	240	0.595
97	7.56	6.88	5.77	4.54	1.202	430	0.733	220	0.646
98	8.11	7.16	5.91	4.60	1.119	470	0.697	220	0.599
99	8.63	7.35	5.98	4.61	1.071	510	0.681	220	0.570
100	9.28	7.51	6.00	4.58	1.036	560	0.677	220	0.548
101	7.70	7.19	6.11	4.86	1.327	360	0.723	200	0.652
102	8.30	7.56	6.34	4.99	1.205	390	0.667	200	0.589
103	8.97	7.90	6.51	5.06	1.114	430	0.632	200	0.542
104	9.59	8.11	6.58	5.07	1.064	470	0.618	200	0.515
105	8.72	8.09	6.86	5.44	1.294	330	0.637	180	0.571
106	9.42	8.51	7.11	5.57	1.176	360	0.590	180	0.517

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7-Element Chebyshev High-Pass Filter Designs— 50-Ohm Impedance, C-In/Out for Standard E24 Capacitor Values

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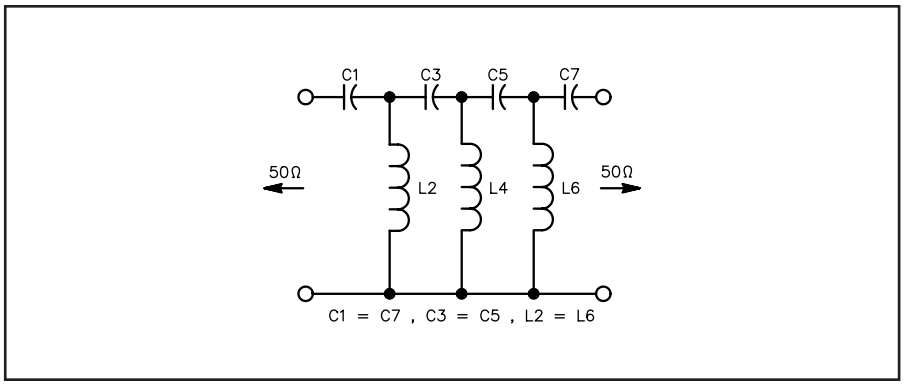
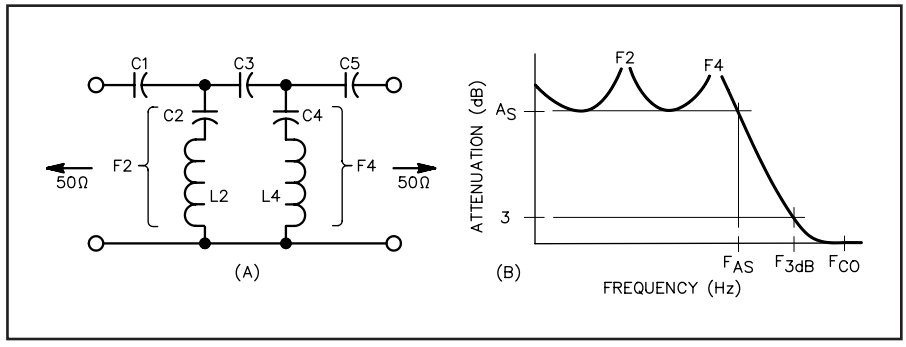


The schematic for a 7-element capacitor input/output Chebyshev high-pass filter. See page 15 for the attenuation response curve.

5-Branch Elliptic High-Pass Filter Designs— 50-Ohm Impedance, Standard E12 Capacitor Values for C1, C3 and C5

Filter No.	F_{co}	F_{3dB} (MHz)	F_{As}	A_s (dB)	Max. SWR	C1	C3	C5 (nF)	C2	C4	L2 (µH)	L4	F2 (MHz)	F4
1	1.01	0.936	0.670	45.9	1.489	2.7	1.8	3.3	20.7	7.24	6.58	8.40	0.431	0.646
2	1.14	0.976	0.608	50.4	1.186	3.3	1.8	3.9	32.3	11.4	5.53	6.54	0.377	0.582
3	1.30	1.01	0.604	49.4	1.071	3.9	1.8	4.7	35.8	12.5	5.19	6.07	0.369	0.578
4	1.19	1.11	0.810	45.4	1.543	2.2	1.5	2.7	16.4	5.71	5.65	7.28	0.523	0.780
5	1.38	1.20	0.797	46.8	1.199	2.7	1.5	3.3	22.0	7.66	4.61	5.65	0.499	0.765
6	1.56	1.19	0.685	51.6	1.064	3.3	1.5	3.9	33.7	11.9	4.32	4.97	0.417	0.655
7	1.51	1.40	1.01	45.9	1.489	1.8	1.2	2.2	13.8	4.82	4.39	5.60	0.646	0.968
8	1.75	1.51	1.00	46.6	1.180	2.2	1.2	2.7	17.7	6.14	3.65	4.47	0.627	0.961
9	2.02	1.52	0.920	48.3	1.055	2.7	1.2	3.3	23.4	8.09	3.44	4.04	0.562	0.880
10	1.78	1.65	1.15	47.8	1.506	1.5	1.0	1.8	12.7	4.47	3.71	4.64	0.733	1.10
11	2.07	1.80	1.20	46.8	1.199	1.8	1.0	2.2	14.7	5.11	3.07	3.77	0.749	1.15
12	2.38	1.83	1.13	47.8	1.064	2.2	1.0	2.7	18.6	6.43	2.87	3.40	0.689	1.08
13	2.22	2.08	1.55	43.7	1.531	1.2	0.82	1.5	8.19	2.83	3.05	4.02	1.01	1.49
14	2.52	2.17	1.39	48.7	1.186	1.5	0.82	1.8	13.5	4.73	2.51	3.01	0.865	1.33
15	2.89	2.23	1.36	48.2	1.065	1.8	0.82	2.2	15.5	5.37	2.36	2.78	0.833	1.30
16	2.57	2.40	1.68	47.8	1.560	1.0	0.68	1.2	8.40	2.96	2.60	3.27	1.08	1.62
17	3.05	2.68	1.85	44.7	1.215	1.2	0.68	1.5	8.77	3.02	2.10	2.64	1.17	1.78
18	3.48	2.66	1.57	49.9	1.063	1.5	0.68	1.8	14.1	4.94	1.96	2.28	0.957	1.50
19	3.17	2.96	2.13	46.1	1.554	0.82	0.56	1.0	6.31	2.21	2.13	2.72	1.37	2.05
20	3.62	3.16	2.05	48.6	1.210	1.0	0.56	1.2	8.93	3.14	1.74	2.10	1.28	1.96
21	4.19	3.30	2.11	46.1	1.076	1.2	0.56	1.5	9.30	3.19	1.61	1.94	1.30	2.02
22	4.30	3.79	2.55	46.9	1.233	0.82	0.47	1.0	6.69	2.33	1.48	1.82	1.60	2.45
23	4.89	3.84	2.31	49.7	1.079	1.0	0.47	1.2	9.34	3.27	1.36	1.59	1.41	2.21
24	5.87	3.89	2.31	47.4	1.021	1.2	0.47	1.5	9.71	3.32	1.35	1.58	1.39	2.20
25	4.44	4.17	3.01	46.5	1.618	0.56	0.39	0.68	4.37	1.53	1.54	1.97	1.94	2.90
26	5.14	4.52	2.99	48.0	1.236	0.68	0.39	0.82	5.88	2.06	1.23	1.50	1.87	2.87
27	5.88	4.67	2.90	48.0	1.085	0.82	0.39	1.0	7.05	2.45	1.13	1.34	1.78	2.78
28	5.99	5.34	3.60	47.1	1.269	0.56	0.33	0.68	4.63	1.62	1.06	1.31	2.27	3.46
29	6.81	5.48	3.37	49.0	1.096	0.68	0.33	0.82	6.15	2.15	0.961	1.13	2.07	3.22
30	8.07	5.50	3.17	49.3	1.026	0.82	0.33	1.0	7.33	2.54	0.945	1.09	1.91	3.02
31	6.38	5.99	4.26	47.3	1.609	0.39	0.27	0.47	3.18	1.12	1.06	1.34	2.74	4.10
32	7.34	6.47	4.18	49.2	1.241	0.47	0.27	0.56	4.33	1.53	0.856	1.03	2.61	4.01
33	8.39	6.73	4.17	48.4	1.092	0.56	0.27	0.68	4.90	1.71	0.784	0.930	2.57	4.00
34	7.92	7.36	4.98	49.6	1.522	0.33	0.22	0.39	3.05	1.08	0.828	1.02	3.17	4.79
35	9.21	8.05	5.27	48.1	1.217	0.39	0.22	0.47	3.40	1.19	0.686	0.832	3.30	5.06
36	10.4	8.18	4.84	50.5	1.077	0.47	0.22	0.56	4.56	1.60	0.636	0.740	2.95	4.62



The schematic for a 5-branch elliptic high-pass filter is shown at A. At B is the typical attenuation response curve.