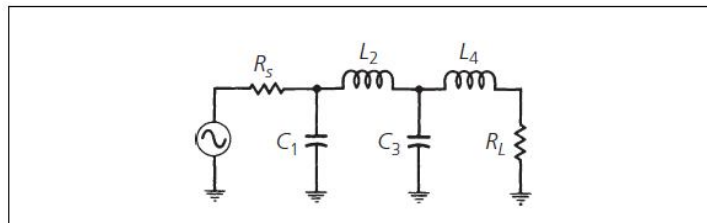


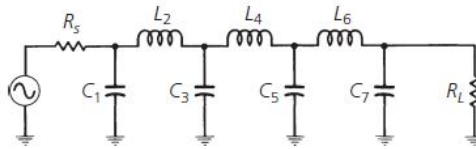
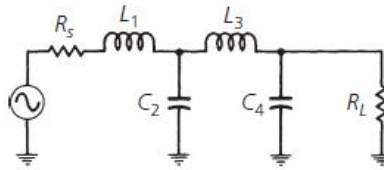
FIG. 3-15. Attenuation characteristics for a Chebyshev filter with 0.01-dB ripple



| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 |
|-----|-----------|-------|-------|-------|-------|
| 2 | 1.101 | 1.347 | 1.483 | | |
| | 1.111 | 1.247 | 1.595 | | |
| | 1.250 | 0.943 | 1.997 | | |

| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 |
|-----|-----------|-------|--------|--------|-------|
| 2 | 1.429 | 0.759 | 2.344 | | |
| | 1.667 | 0.609 | 2.750 | | |
| | 2.000 | 0.479 | 3.277 | | |
| | 2.500 | 0.363 | 4.033 | | |
| | 3.333 | 0.259 | 5.255 | | |
| | 5.000 | 0.164 | 7.650 | | |
| | 10.000 | 0.078 | 14.749 | | |
| | ∞ | 1.412 | 0.742 | | |
| 3 | 1.000 | 1.181 | 1.821 | 1.181 | |
| | 0.900 | 1.092 | 1.660 | 1.480 | |
| | 0.800 | 1.097 | 1.443 | 1.806 | |
| | 0.700 | 1.160 | 1.228 | 2.165 | |
| | 0.600 | 1.274 | 1.024 | 2.598 | |
| | 0.500 | 1.452 | 0.829 | 3.164 | |
| | 0.400 | 1.734 | 0.645 | 3.974 | |
| | 0.300 | 2.216 | 0.470 | 5.280 | |
| | 0.200 | 3.193 | 0.305 | 7.834 | |
| | 0.100 | 6.141 | 0.148 | 15.390 | |
| | ∞ | 1.501 | 1.433 | 0.591 | |

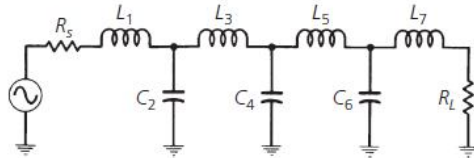
| | | | | | |
|-----|-----------|-------|--------|-------|--------|
| 4 | 1.100 | 0.950 | 1.938 | 1.761 | 1.046 |
| | 1.111 | 0.854 | 1.946 | 1.744 | 1.165 |
| | 1.250 | 0.618 | 2.075 | 1.542 | 1.617 |
| | 1.429 | 0.495 | 2.279 | 1.334 | 2.008 |
| | 1.667 | 0.398 | 2.571 | 1.128 | 2.461 |
| | 2.000 | 0.316 | 2.994 | 0.926 | 3.045 |
| | 2.500 | 0.242 | 3.641 | 0.729 | 3.875 |
| | 3.333 | 0.174 | 4.727 | 0.538 | 5.209 |
| | 5.000 | 0.112 | 6.910 | 0.352 | 7.813 |
| | 10.000 | 0.054 | 13.469 | 0.173 | 15.510 |
| | ∞ | 1.529 | 1.694 | 1.312 | 0.523 |
| n | R_L/R_5 | L_1 | C_2 | L_3 | C_4 |



| n | R_5/R_L | C_1 | L_2 | C_3 | L_4 | C_5 | L_6 | C_7 |
|-----|-----------|-------|-------|--------|-------|--------|-------|-------|
| 5 | 1.000 | 0.977 | 1.685 | 2.037 | 1.685 | 0.977 | | |
| | 0.900 | 0.880 | 1.456 | 2.174 | 1.641 | 1.274 | | |
| | 0.800 | 0.877 | 1.235 | 2.379 | 1.499 | 1.607 | | |
| | 0.700 | 0.926 | 1.040 | 2.658 | 1.323 | 1.977 | | |
| | 0.600 | 1.019 | 0.863 | 3.041 | 1.135 | 2.424 | | |
| | 0.500 | 1.166 | 0.699 | 3.584 | 0.942 | 3.009 | | |
| | 0.400 | 1.398 | 0.544 | 4.403 | 0.749 | 3.845 | | |
| | 0.300 | 1.797 | 0.398 | 5.772 | 0.557 | 5.193 | | |
| | 0.200 | 2.604 | 0.259 | 8.514 | 0.368 | 7.826 | | |
| | 0.100 | 5.041 | 0.127 | 16.741 | 0.182 | 15.613 | | |
| | ∞ | 1.547 | 1.795 | 1.645 | 1.237 | 0.488 | | |

| | | | | | | | | |
|---|----------|-------|--------|-------|--------|-------|--------|--|
| 6 | 1.101 | 0.851 | 1.796 | 1.841 | 2.027 | 1.631 | 0.937 | |
| | 1.111 | 0.760 | 1.782 | 1.775 | 2.094 | 1.638 | 1.053 | |
| | 1.250 | 0.545 | 1.864 | 1.489 | 2.403 | 1.507 | 1.504 | |
| | 1.429 | 0.436 | 2.038 | 1.266 | 2.735 | 1.332 | 1.899 | |
| | 1.667 | 0.351 | 2.298 | 1.061 | 3.167 | 1.145 | 2.357 | |
| | 2.000 | 0.279 | 2.678 | 0.867 | 3.768 | 0.954 | 2.948 | |
| | 2.500 | 0.214 | 3.261 | 0.682 | 4.667 | 0.761 | 3.790 | |
| | 3.333 | 0.155 | 4.245 | 0.503 | 6.163 | 0.568 | 5.143 | |
| | 5.000 | 0.100 | 6.223 | 0.330 | 9.151 | 0.376 | 7.785 | |
| | 10.000 | 0.048 | 12.171 | 0.162 | 18.105 | 0.187 | 15.595 | |
| | ∞ | 1.551 | 1.847 | 1.790 | 1.598 | 1.190 | 0.469 | |

| | | | | | | | | |
|----------|-----------|-------|-------|--------|-------|--------|-------|--------|
| 7 | 1.000 | 0.913 | 1.595 | 2.002 | 1.870 | 2.002 | 1.595 | 0.913 |
| | 0.900 | 0.816 | 1.362 | 2.089 | 1.722 | 2.202 | 1.581 | 1.206 |
| | 0.800 | 0.811 | 1.150 | 2.262 | 1.525 | 2.465 | 1.464 | 1.538 |
| | 0.700 | 0.857 | 0.967 | 2.516 | 1.323 | 2.802 | 1.307 | 1.910 |
| | 0.600 | 0.943 | 0.803 | 2.872 | 1.124 | 3.250 | 1.131 | 2.359 |
| | 0.500 | 1.080 | 0.650 | 3.382 | 0.928 | 3.875 | 0.947 | 2.948 |
| | 0.400 | 1.297 | 0.507 | 4.156 | 0.735 | 4.812 | 0.758 | 3.790 |
| | 0.300 | 1.669 | 0.372 | 5.454 | 0.546 | 6.370 | 0.568 | 5.148 |
| | 0.200 | 2.242 | 0.242 | 8.057 | 0.360 | 9.484 | 0.378 | 7.802 |
| | 0.100 | 4.701 | 0.119 | 15.872 | 0.178 | 18.818 | 0.188 | 15.652 |
| | ∞ | 1.559 | 1.867 | 1.866 | 1.765 | 1.563 | 1.161 | 0.456 |
| <i>n</i> | R_L/R_S | L_1 | C_2 | L_3 | C_4 | L_5 | C_6 | L_7 |



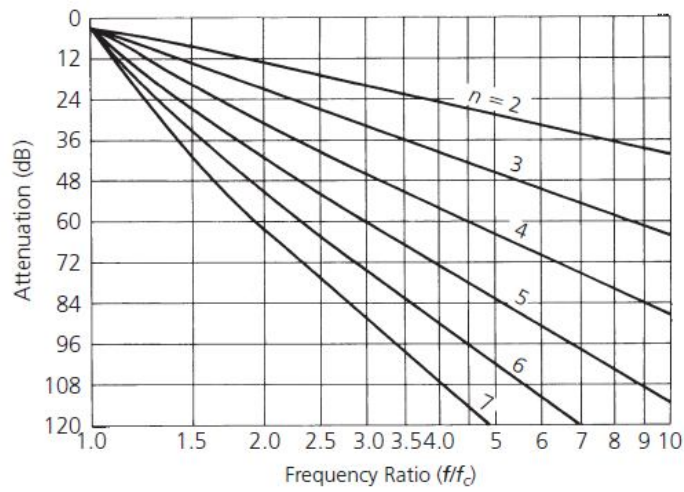
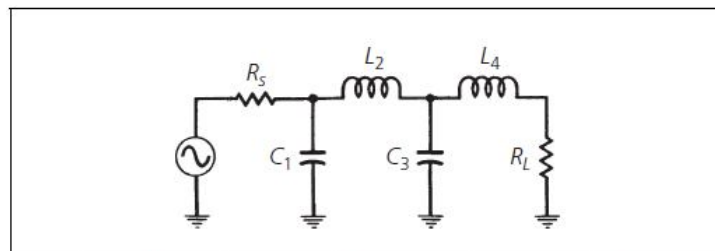


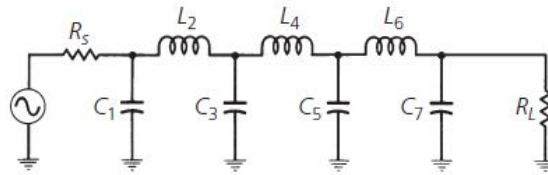
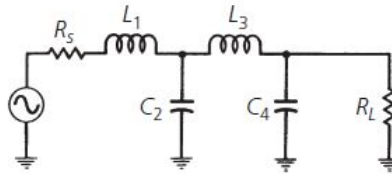
FIG. 3-16. Attenuation characteristics for a Chebyshev filter with 0.1-dB ripple.



| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 |
|----------|-----------|-------|--------|-------|-------|
| 2 | 1.355 | 1.209 | 1.638 | | |
| | 1.429 | 0.977 | 1.982 | | |
| | 1.667 | 0.733 | 2.489 | | |
| | 2.000 | 0.560 | 3.054 | | |
| | 2.500 | 0.417 | 3.827 | | |
| | 3.333 | 0.293 | 5.050 | | |
| | 5.000 | 0.184 | 7.426 | | |
| | 10.000 | 0.087 | 14.433 | | |
| ∞ | 1.391 | 0.819 | | | |

| | | | | | |
|---|----------|-------|-------|--------|--|
| 3 | 1.000 | 1.433 | 1.594 | 1.433 | |
| | 0.900 | 1.426 | 1.494 | 1.622 | |
| | 0.800 | 1.451 | 1.356 | 1.871 | |
| | 0.700 | 1.521 | 1.193 | 2.190 | |
| | 0.600 | 1.648 | 1.017 | 2.603 | |
| | 0.500 | 1.853 | 0.838 | 3.159 | |
| | 0.400 | 2.186 | 0.660 | 3.968 | |
| | 0.300 | 2.763 | 0.486 | 5.279 | |
| | 0.200 | 3.942 | 0.317 | 7.850 | |
| | 1.100 | 7.512 | 0.155 | 15.466 | |
| | ∞ | 1.513 | 1.510 | 0.716 | |

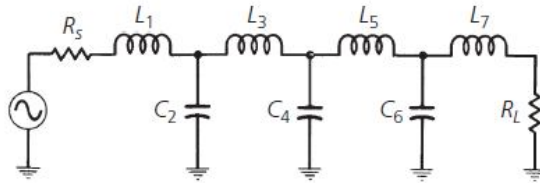
| | | | | | |
|-----|-----------|-------|--------|-------|--------|
| 4 | 1.355 | 0.992 | 2.148 | 1.585 | 1.341 |
| | 1.429 | 0.779 | 2.348 | 1.429 | 1.700 |
| | 1.667 | 0.576 | 2.730 | 1.185 | 2.243 |
| | 2.000 | 0.440 | 3.227 | 0.967 | 2.856 |
| | 2.500 | 0.329 | 3.961 | 0.760 | 3.698 |
| | 3.333 | 0.233 | 5.178 | 0.560 | 5.030 |
| | 5.000 | 0.148 | 7.607 | 0.367 | 7.614 |
| | 10.000 | 0.070 | 14.887 | 0.180 | 15.230 |
| | ∞ | 1.511 | 1.768 | 1.455 | 0.673 |
| n | R_L/R_S | L_1 | C_2 | L_3 | C_4 |



| n | R_S/R_L | C_1 | L_2 | C_3 | L_4 | C_5 | L_6 | C_7 |
|-----|-----------|-------|-------|--------|-------|--------|-------|-------|
| 5 | 1.000 | 1.301 | 1.556 | 2.241 | 1.556 | 1.301 | | |
| | 0.900 | 1.285 | 1.433 | 2.380 | 1.488 | 1.488 | | |
| | 0.800 | 1.300 | 1.282 | 2.582 | 1.382 | 1.738 | | |
| | 0.700 | 1.358 | 1.117 | 2.868 | 1.244 | 2.062 | | |
| | 0.600 | 1.470 | 0.947 | 3.269 | 1.085 | 2.484 | | |
| | 0.500 | 1.654 | 0.778 | 3.845 | 0.913 | 3.055 | | |
| | 0.400 | 1.954 | 0.612 | 4.720 | 0.733 | 3.886 | | |
| | 0.300 | 2.477 | 0.451 | 6.196 | 0.550 | 5.237 | | |
| | 0.200 | 3.546 | 0.295 | 9.127 | 0.366 | 7.889 | | |
| | 0.100 | 6.787 | 0.115 | 17.957 | 0.182 | 15.745 | | |
| | ∞ | 1.561 | 1.807 | 1.766 | 1.417 | 0.651 | | |

| | | | | | | | | |
|---|----------|-------|--------|-------|--------|-------|--------|--|
| 6 | 1.355 | 0.942 | 2.080 | 1.659 | 2.247 | 1.534 | 1.277 | |
| | 1.429 | 0.735 | 2.249 | 1.454 | 2.544 | 1.405 | 1.629 | |
| | 1.667 | 0.542 | 2.600 | 1.183 | 3.064 | 1.185 | 2.174 | |
| | 2.000 | 0.414 | 3.068 | 0.958 | 3.712 | 0.979 | 2.794 | |
| | 2.500 | 0.310 | 3.765 | 0.749 | 4.651 | 0.778 | 3.645 | |
| | 3.333 | 0.220 | 4.927 | 0.551 | 6.195 | 0.580 | 4.996 | |
| | 5.000 | 0.139 | 7.250 | 0.361 | 9.261 | 0.384 | 7.618 | |
| | 10.000 | 0.067 | 14.220 | 0.178 | 18.427 | 0.190 | 15.350 | |
| | ∞ | 1.534 | 1.884 | 1.831 | 1.749 | 1.394 | 0.638 | |

| | | | | | | | | |
|-----|-----------|-------|-------|--------|-------|--------|-------|--------|
| 7 | 1.000 | 1.262 | 1.520 | 2.239 | 1.680 | 2.239 | 1.520 | 1.262 |
| | 0.900 | 1.242 | 1.395 | 2.361 | 1.578 | 2.397 | 1.459 | 1.447 |
| | 0.800 | 1.255 | 1.245 | 2.548 | 1.443 | 2.624 | 1.362 | 1.697 |
| | 0.700 | 1.310 | 1.083 | 2.819 | 1.283 | 2.942 | 1.233 | 2.021 |
| | 0.600 | 1.417 | 0.917 | 3.205 | 1.209 | 3.384 | 1.081 | 2.444 |
| | 0.500 | 1.595 | 0.753 | 3.764 | 0.928 | 4.015 | 0.914 | 3.018 |
| | 0.400 | 1.885 | 0.593 | 4.618 | 0.742 | 4.970 | 0.738 | 3.855 |
| | 0.300 | 2.392 | 0.437 | 6.054 | 0.556 | 6.569 | 0.557 | 5.217 |
| | 0.200 | 3.428 | 0.286 | 8.937 | 0.369 | 9.770 | 0.372 | 7.890 |
| | 0.100 | 6.570 | 0.141 | 17.603 | 0.184 | 19.376 | 0.186 | 15.813 |
| | ∞ | 1.575 | 1.858 | 1.921 | 1.827 | 1.734 | 1.379 | 0.631 |
| n | R_L/R_S | L_1 | C_2 | L_3 | C_4 | L_5 | C_6 | L_7 |



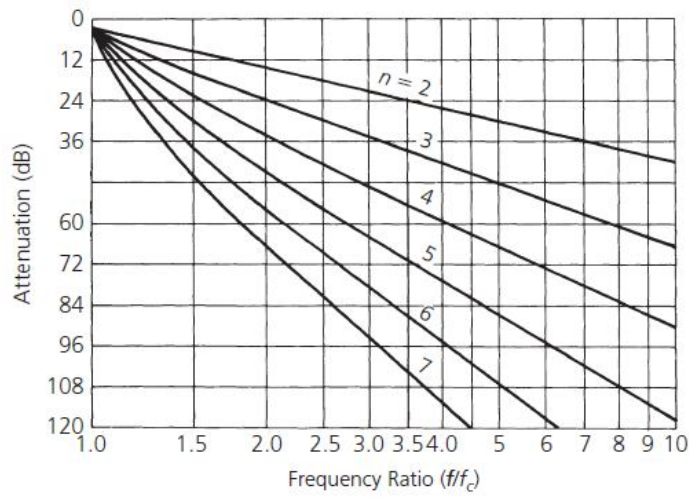
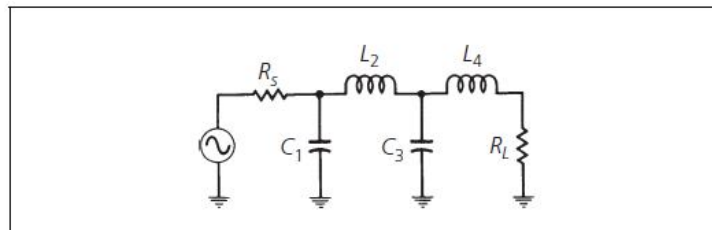


FIG. 3-17. Attenuation characteristics for a Chebyshev filter with 0.5-dB ripple.

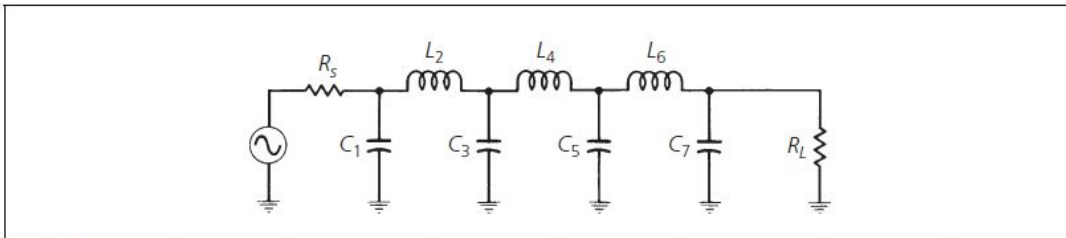
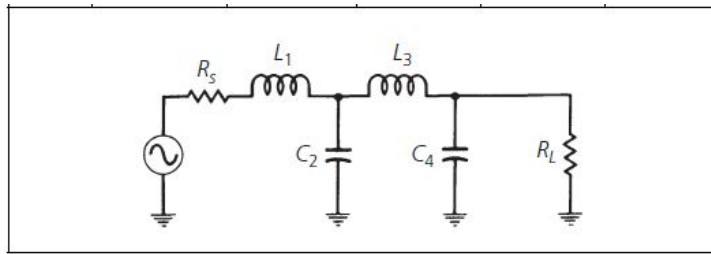


| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 |
|----------|-----------|-------|--------|-------|-------|
| 2 | 1.984 | 0.983 | 1.950 | | |
| | 2.000 | 0.909 | 2.103 | | |
| | 2.500 | 0.564 | 3.165 | | |
| | 3.333 | 0.375 | 4.411 | | |
| | 5.000 | 0.228 | 6.700 | | |
| | 10.000 | 0.105 | 13.322 | | |
| ∞ | 1.307 | 0.975 | | | |

| | | | | | |
|---|----------|-------|-------|--------|--|
| 3 | 1.000 | 1.864 | 1.280 | 1.834 | |
| | 0.900 | 1.918 | 1.209 | 2.026 | |
| | 0.800 | 1.997 | 1.120 | 2.237 | |
| | 0.700 | 2.114 | 1.015 | 2.517 | |
| | 0.500 | 2.557 | 0.759 | 3.436 | |
| | 0.400 | 2.985 | 0.615 | 4.242 | |
| | 0.300 | 3.729 | 0.463 | 5.576 | |
| | 0.200 | 5.254 | 0.309 | 8.225 | |
| | 0.100 | 9.890 | 0.153 | 16.118 | |
| | ∞ | 1.572 | 1.518 | 0.932 | |

| | | | | | |
|---|----------|-------|--------|-------|--------|
| 4 | 1.984 | 0.920 | 2.586 | 1.304 | 1.826 |
| | 2.000 | 0.845 | 2.720 | 1.238 | 1.985 |
| | 2.500 | 0.516 | 3.766 | 0.869 | 3.121 |
| | 3.333 | 0.344 | 5.120 | 0.621 | 4.480 |
| | 5.000 | 0.210 | 7.708 | 0.400 | 6.987 |
| | 10.000 | 0.098 | 15.352 | 0.194 | 14.262 |
| | ∞ | 1.436 | 1.889 | 1.521 | 0.913 |

| n | R_L/R_s | L_1 | C_2 | L_3 | C_4 |
|-----|-----------|-------|-------|-------|-------|
|-----|-----------|-------|-------|-------|-------|

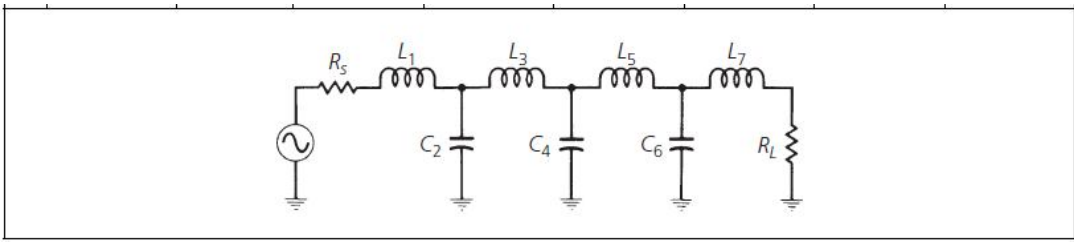


| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 | C_5 | L_6 | C_7 |
|-----|-----------|-------|-------|--------|-------|--------|-------|-------|
| 5 | 1.000 | 1.807 | 1.303 | 2.691 | 1.303 | 1.807 | | |
| | 0.900 | 1.854 | 1.222 | 2.849 | 1.238 | 1.970 | | |
| | 0.800 | 1.926 | 1.126 | 3.060 | 1.157 | 2.185 | | |
| | 0.700 | 2.035 | 1.015 | 3.353 | 1.058 | 2.470 | | |
| | 0.600 | 2.200 | 0.890 | 3.765 | 0.942 | 2.861 | | |
| | 0.500 | 2.457 | 0.754 | 4.367 | 0.810 | 3.414 | | |
| | 0.400 | 2.870 | 0.609 | 5.296 | 0.664 | 4.245 | | |
| | 0.300 | 3.588 | 0.459 | 6.871 | 0.508 | 5.625 | | |
| | 0.200 | 5.064 | 0.306 | 10.054 | 0.343 | 8.367 | | |
| | 0.100 | 9.556 | 0.153 | 19.647 | 0.173 | 16.574 | | |
| | ∞ | 1.630 | 1.740 | 1.922 | 1.514 | 0.903 | | |

| | | | | | | | | |
|---|--------|-------|--------|-------|--------|-------|--------|--|
| 6 | 1.984 | 0.905 | 2.577 | 1.368 | 2.713 | 1.299 | 1.796 | |
| | 2.000 | 0.830 | 2.704 | 1.291 | 2.872 | 1.237 | 1.956 | |
| | 2.500 | 0.506 | 3.722 | 0.890 | 4.109 | 0.881 | 3.103 | |
| | 3.333 | 0.337 | 5.055 | 0.632 | 5.699 | 0.635 | 4.481 | |
| | 5.000 | 0.206 | 7.615 | 0.406 | 8.732 | 0.412 | 7.031 | |
| | 10.000 | 0.096 | 15.186 | 0.197 | 17.681 | 0.202 | 14.433 | |

| | | | | | | | | |
|----------|-------|-------|-------|--------|-------|--------|-------|--------|
| 7 | 1.000 | 1.790 | 1.296 | 2.718 | 1.385 | 2.718 | 1.296 | 1.790 |
| | 0.900 | 1.835 | 1.215 | 2.869 | 1.308 | 2.883 | 1.234 | 1.953 |
| | 0.800 | 1.905 | 1.118 | 3.076 | 1.215 | 3.107 | 1.155 | 2.168 |
| | 0.700 | 2.011 | 1.007 | 3.364 | 1.105 | 3.416 | 1.058 | 2.455 |
| | 0.600 | 2.174 | 0.882 | 3.772 | 0.979 | 3.852 | 0.944 | 2.848 |
| | 0.500 | 2.428 | 0.747 | 4.370 | 0.838 | 4.289 | 0.814 | 3.405 |
| | 0.400 | 2.835 | 0.604 | 5.295 | 0.685 | 5.470 | 0.669 | 4.243 |
| | 0.300 | 3.546 | 0.455 | 6.867 | 0.522 | 7.134 | 0.513 | 5.635 |
| | 0.200 | 5.007 | 0.303 | 10.049 | 0.352 | 10.496 | 0.348 | 8.404 |
| | 0.100 | 9.456 | 0.151 | 19.649 | 0.178 | 20.631 | 0.176 | 16.665 |
| ∞ | 1.646 | 1.777 | 2.031 | 1.789 | 1.924 | 1.503 | 0.895 | |

| n | R_L/R_s | L_1 | C_2 | L_3 | C_4 | L_5 | C_6 | L_7 |
|-----|-----------|-------|-------|-------|-------|-------|-------|-------|
|-----|-----------|-------|-------|-------|-------|-------|-------|-------|



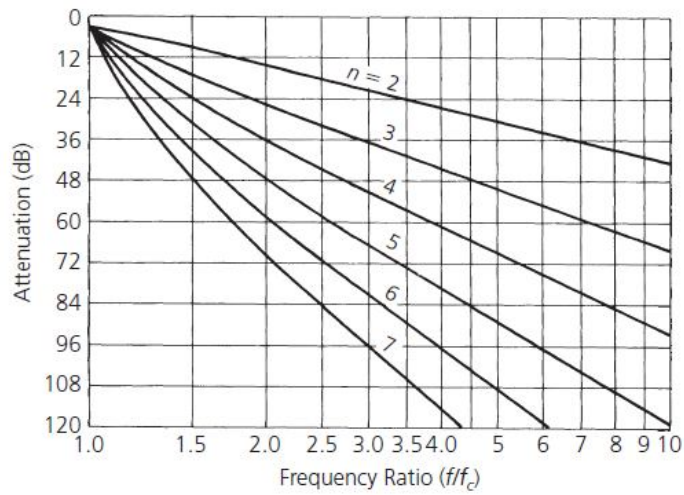
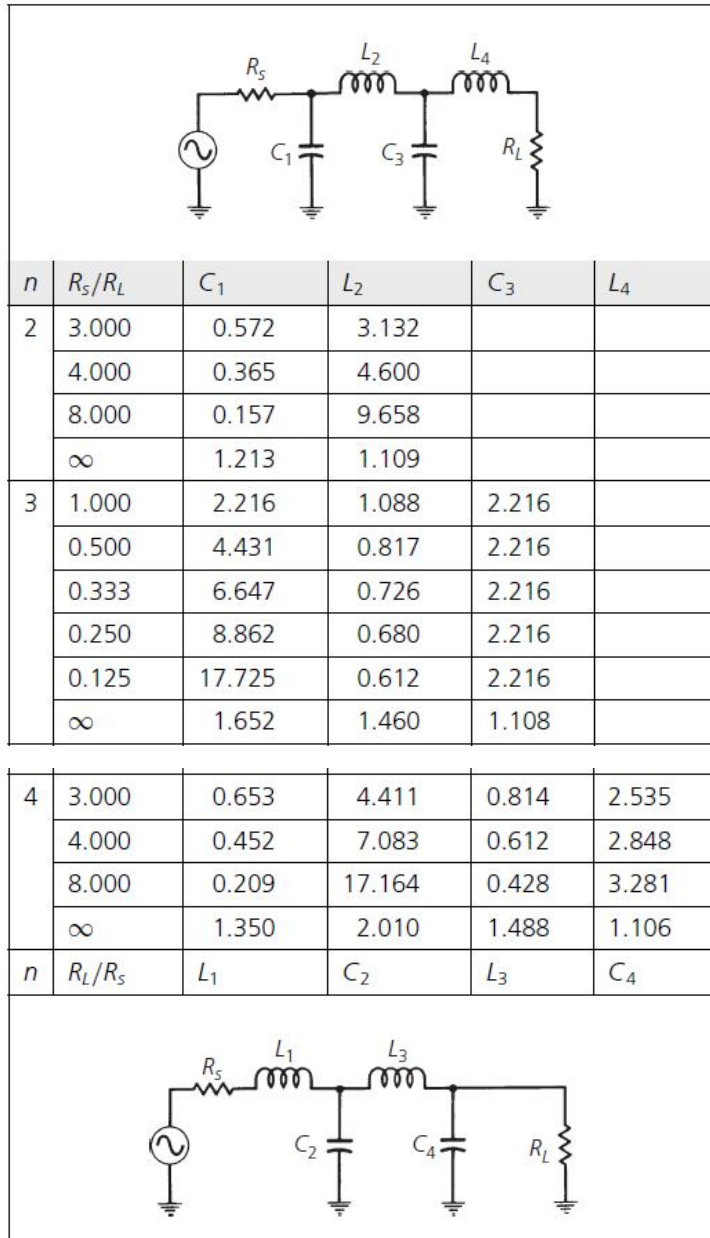
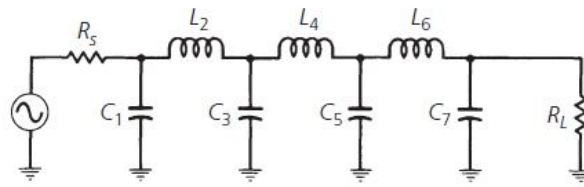


FIG. 3-18. Attenuation characteristics for a Chebyshev filter with 1-dB ripple.





| n | R_s/R_L | C_1 | L_2 | C_3 | L_4 | C_5 | L_6 | C_7 |
|-----|-----------|--------|--------|--------|--------|-------|-------|-------|
| 5 | 1.000 | 2.207 | 1.128 | 3.103 | 1.128 | 2.207 | | |
| | 0.500 | 4.414 | 0.565 | 4.653 | 1.128 | 2.207 | | |
| | 0.333 | 6.622 | 0.376 | 6.205 | 1.128 | 2.207 | | |
| | 0.250 | 8.829 | 0.282 | 7.756 | 1.128 | 2.207 | | |
| | 0.125 | 17.657 | 0.141 | 13.961 | 1.128 | 2.207 | | |
| | ∞ | 1.721 | 1.645 | 2.061 | 1.493 | 1.103 | | |
| 6 | 3.000 | 0.679 | 3.873 | 0.771 | 4.711 | 0.969 | 2.406 | |
| | 4.000 | 0.481 | 5.644 | 0.476 | 7.351 | 0.849 | 2.582 | |
| | 8.000 | 0.227 | 12.310 | 0.198 | 16.740 | 0.726 | 2.800 | |
| | ∞ | 1.378 | 2.097 | 1.690 | 2.074 | 1.494 | 1.102 | |

| 7 | 1.000 | 2.204 | 1.131 | 3.147 | 1.194 | 3.147 | 1.131 | 2.204 |
|-----|-----------|--------|-------|--------|-------|-------|-------|-------|
| | 0.500 | 4.408 | 0.566 | 6.293 | 0.895 | 3.147 | 1.131 | 2.204 |
| | 0.333 | 6.612 | 0.377 | 9.441 | 0.796 | 3.147 | 1.131 | 2.204 |
| | 0.250 | 8.815 | 0.283 | 12.588 | 0.747 | 3.147 | 1.131 | 2.204 |
| | 0.125 | 17.631 | 0.141 | 25.175 | 0.671 | 3.147 | 1.131 | 2.204 |
| | ∞ | 1.741 | 1.677 | 2.155 | 1.703 | 2.079 | 1.494 | 1.102 |
| n | R_L/R_s | L_1 | C_2 | L_3 | C_4 | L_5 | C_6 | L_7 |

