Innovation in Every Wave

LC Filters

InnowaveRF designs and manufactures discrete component (LC) filters that provide a superior performance in a small package for a wide range of critical applications. InnowaveRF utilizes creative component layouts that shrink the overall package size. We use innovative packaging to provide additional Shielding and Better Rejection. All our filters are Epoxy encapsulated or sealed in metal cans for rugged applications and are more tolerant to shock and vibrations. Our designs have high "Q" air wound or toroidal inductors and monolithic ceramic capacitors for best possible performance and have RF absorbing foam for better shielding. We offer a variety of packaging styles such as surface mount, connectorized (BNC, SMA or N-Type), printed circuit board mount or drop-in to suit customer needs.

- Excellent Passband Insertion Loss.
- Compact size
- Low VSWR
- High Q and Excellent Selectivity
- Good Ultimate Rejection capabilities (up to 10X the Cut-off frequency)
- Guassian, Bessel, Butterworth, Chebyshev & Elliptic structures
- Shock and Vibration resistant
- Designed d using State-of-Art Computer Design Programs
- Balanced or Unbalanced structures available

Frequency	3 dB Bandwidth (%)	VSWR	No. of Sections	Insertion Loss (dB)	Impedance Range
10Hz – 6.00GHz	0.1 - 50	1.5:1	Depends on the requirement	Depends on the number of sections	50Ω - 1000Ω

The Attenuation Characteristics Curve shown below shows the Stop band frequencies normalized to the 3 dB Bandwidth for different filter sections. This gives a very good estimation of the Number of Sections that is required to design a filter for a given Stop band Attenuation.

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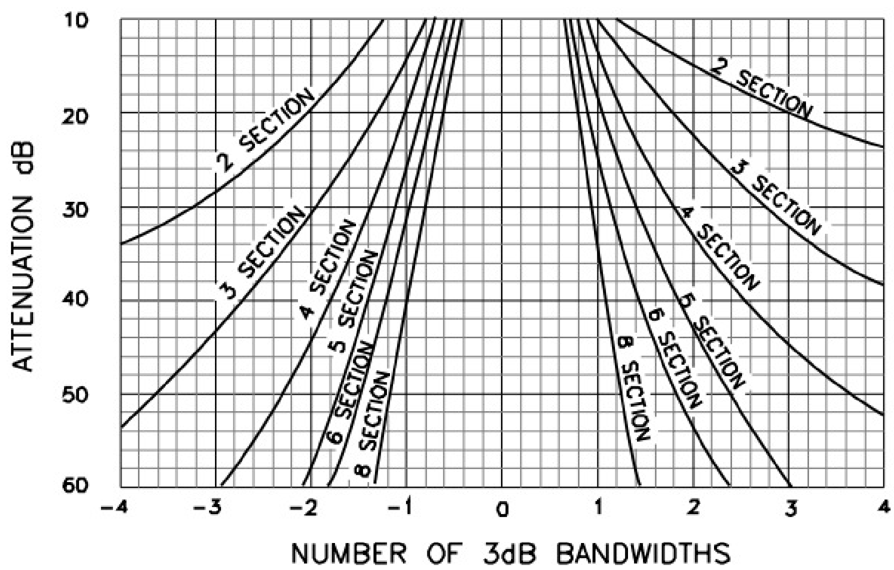

Typical example to calculate the number of sections

A filter has a *Center Frequency (f0)* of 2000 MHz and a *3 dB Bandwidth* of 20 MHz. The required response has a *Stop band Attenuation* of 60 dB at 1980 MHz and 2030 MHz.

- The percentage bandwidth is 1%, calculated as follows:

$$\frac{3dBBandwidth(MHz)}{f_0(MHz)} \times 100 = \frac{20}{2000} = 1\%$$

- For the first Stop band requirement is for 1980 MHz

Number of 3 dB Bandwidths from center frequency = $\frac{2000-1980}{20}$ = 1

From the Attenuation Characteristics Curve, we find that 7 sections are minimum required.

- For the second Stop band requirement is for 2030 MHz

Number of 3 dB Bandwidths from center frequency = $\frac{2030-2000}{20}$ = 1.5

From the Attenuation Characteristics Curve, we find that 6 sections are minimum required.

- Therefore to achieve the full specifications of the stop band frequencies, we need to go with the highest order that was derived from the above set of equations i.e., in this case 7 Sections are required for such a filter.