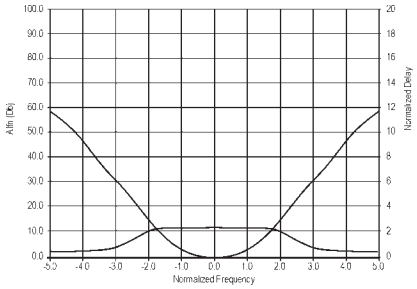
Detailed Crystal Filter Categories

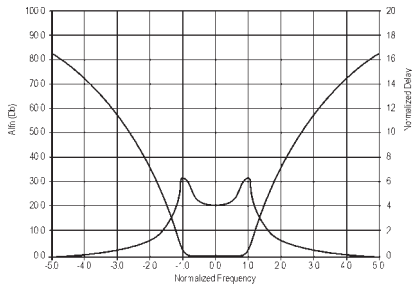
Bessel Filter

A filter whose transfer function is derived from a Bessel Polynomial. The approximation gives a filter having a maximally flat time delay but has poor selectivity. This type of filter is close to a Gaussian filter. It has poor VSWR and loses its maximally flat delay properties at wider bandwidths.



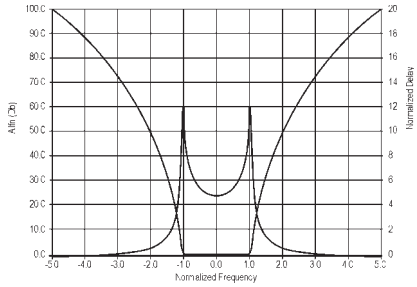
Butterworth Filter

A filter whose transfer function offers maximally flat amplitude. Selectivity is better than Gaussian or Bessel filters but the delay and phase linearity are worse. The VSWR at center is extremely good. Butterworth filters, in most instances, are the least sensitive to changes in element values.



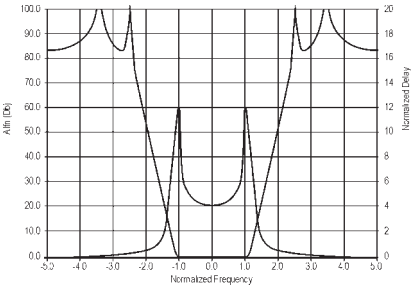
Chebychev Filter

A filter whose transfer function is derived from a Checbychev equal ripple function in the passband only. These filters offer performance between that of Elliptic function filters and Butterworth filters. For the majority of applications, this is the preferred filter type as they offer improved selectivity when compared to Butterworth filters but result in simpler networks than Elliptic function filters.



Elliptic Function Filter

A filter whose transfer function is derived with the use of Jacobean elliptic functions. The amplitude is equal ripple in both passband and stopband. This type of filter offers the most selectivity per pole but has the worst delay and phase linear performance. These filters can sometimes be designed wider than Butterworth or Chebychev filters thereby offering reduced insertion loss.



Gaussian Filter

A filter whose transfer function is derived from a Gaussian function. These filters have zero overshoot on the step and impulse response. Rise times and delay are the lowest of the traditional transfer functions. The response is very close to that of the Bessel filter giving poor selectivity and high sensitivity in exchange for superior delay and phase linearity.