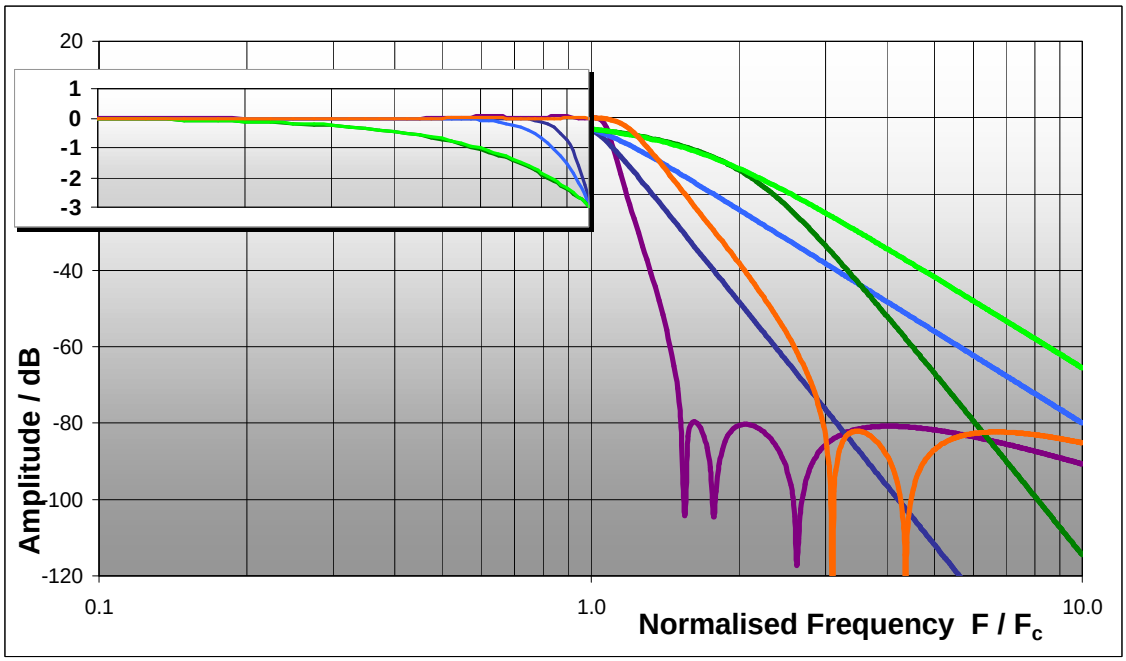
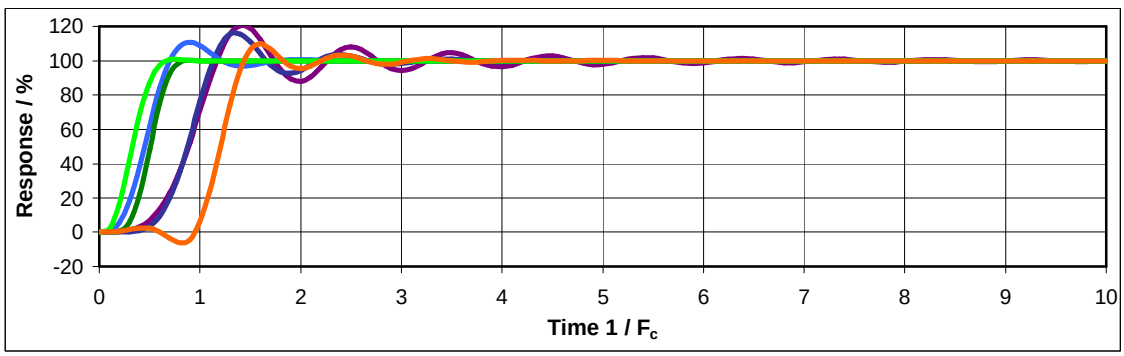
Standard Filter Responses

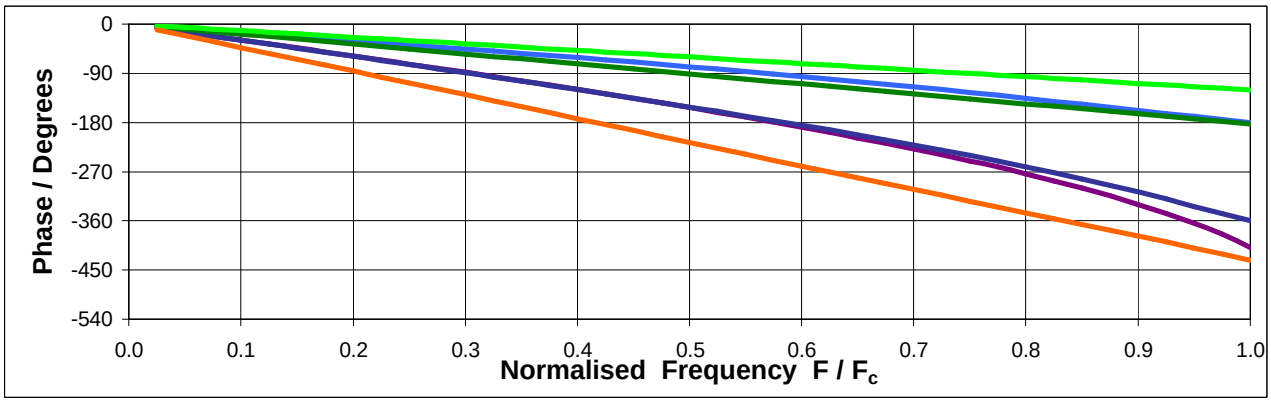


Theoretical Amplitude Response

Filter Description	Type	Comments
Anti aliasing	01	Flat to cut off, sharp filter for anti-aliasing and similar applications. 136 dB/Octave equivalent slope, -80dB stop band. > - 79 dB at 2 F_c
General purpose	41	Flat to cut off, linear phase, good general purpose filter 52 dB/Octave equivalent slope, -82dB stop band. - 31 dB at 2 F_c
8 pole Butterworth	03	Classic 8 pole 48dB/Octave Butterworth filter, -3dB at cut off 48 dB/Octave equivalent slope, monotonic stop band. - 48 dB at 2 F_c
4 pole Butterworth	05	Classic 4 pole 24dB/Octave Butterworth filter, -3dB at cut off 24 dB/Octave equivalent slope, monotonic stop band. - 24 dB at 2 F_c
8 pole Bessel	07	Classic 8 pole 48dB/Octave Bessel filter, -3dB at cut off 48 dB/Octave equivalent slope, monotonic stop band. - 24 dB at 2 F_c
4 pole Bessel	09	Classic 4 pole 24dB/Octave Bessel filter, -3dB at cut off 24 dB/Octave equivalent slope, monotonic stop band. - 13 dB at 2 F_c

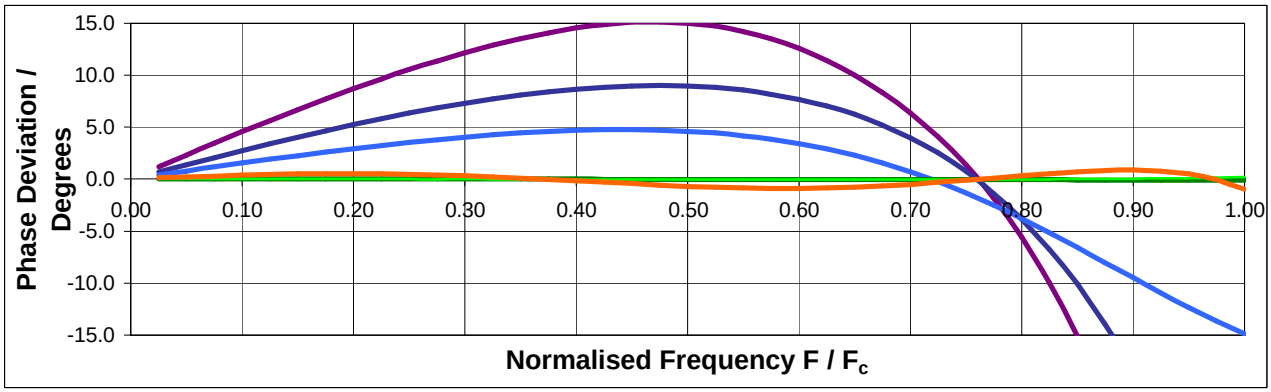


Time Response to Step Input



Passband Phase Response

The curves above show the theoretical phase response of the standard filter responses



Passband Phase Deviation

The curves above show the theoretical passband phase variation for the standard filter responses.

Standard Filter Responses

Anti-Aliasing **(01)** – a filter optimized for anti-aliasing protection before sampling and A-D conversion, where analysis is in the frequency domain.
General Purpose **(41)** – a filter optimized for low signal distortion. Flat passband and linear phase characteristics, with moderate settling time.
Butterworth (**03, 05**) – traditional Butterworth filters, often used to match existing systems, type **01** is superior for alias protection, and type **41** is a better general purpose filter.
Bessel (**07**, **09**) – traditional Bessel filters, linear phase, and low time delay with minimal overshoot, but with significant roll off in the passband.

General Notes about Filter Responses

Selecting a filter is a compromise. We have been manufacturing filters since 1965, and this sheet shows our selection of standard filter responses which, over the years are suitable for most applications. It is important to consider the overall effect of the filter on the signal, passband phase and amplitude are important, and to consider the total effect of the filter on the signal.