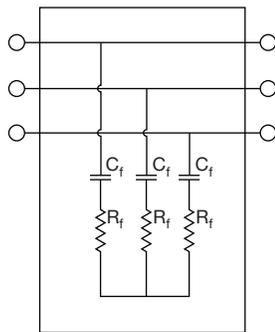




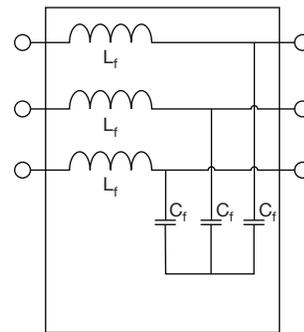
# ACMKP Rectangular - Various Passive Filter Topologies for Motor Protection

By Hans Lohr

Passive filters are used at the output of a drive connected to an electric motor in order to mitigate the negative effects of fast rise times and high peak voltages. These low pass filters are commonly needed when the motor leads are long, or a wide band-gap drive – such as SiC - is used. Below a few of the most common types:



RC Filter



LC Sine Wave Filter

It is possible to eliminate  $dv/dt$  and overshoot problems by employing a second-order **LC sine wave filter** at the drive output. This filter provides near sinusoidal waveforms at the motor terminals. However, it is quite a bit larger than other filters due to the larger L and C values needed to bring the filter corner frequency below the PWM frequency.