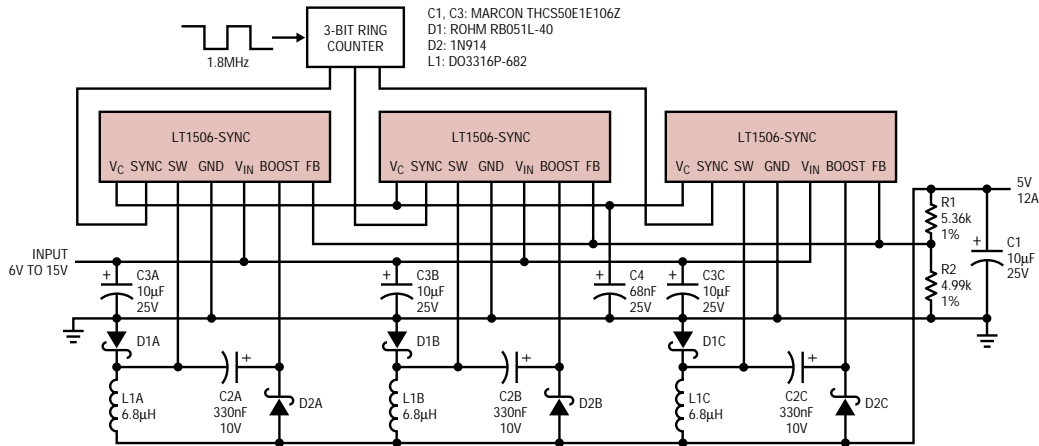


High Power Buck Converter Minimizes Inductor Size

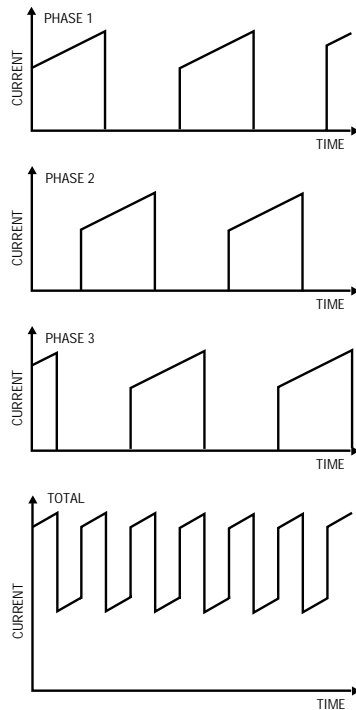
In some applications calling for high power DC/DC conversion in a confined space, it may pay to consider a multiple phase switcher design as shown here. This current sharing supply uses three **LT1506** 500kHz buck mode switching regulators to produce 5V at 12A. The inductor size is considerably reduced because three 4A inductors store less energy ($1/2LI^2$) than a single 12A coil. In addition, synchronizing three converters 120° out of phase with each other reduces the input and output ripple currents. This in turn reduces the ripple rating and size and cost of the filter capacitors.

Current sharing is accomplished by connecting the V_C pins to a common compensation capacitor, C4. Tolerances in the reference voltages cause small

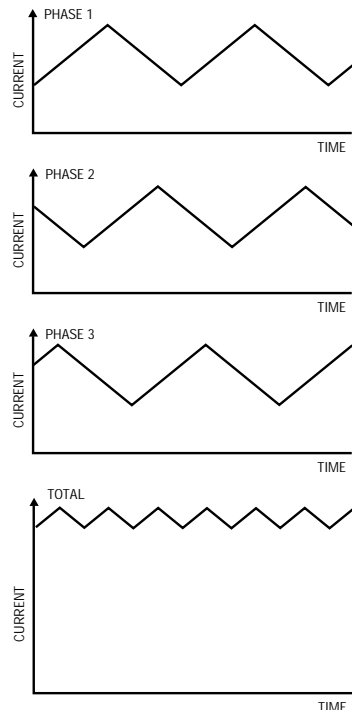
offset currents to flow between the V_C pins. The overall effect is that the loop regulates the output at a voltage somewhere between the min and max references of the devices used. Switch current matching between devices will be typically better than 300mA over the full current range. The negative temperature coefficient of the V_C -to-switch-current transconductance prevents current hogging. A common V_C voltage forces each **LT1506-SYNC** to operate at the same switch current, not at the same duty cycle. This is useful in distributed power systems where the input voltage to each device could vary due to drops across the backplane, copper losses and connectors.



Input Current Waveforms



Output Current Waveforms



Source: Linear Technology Magazine, August 1998
www.linear-tech.com/distrib.html