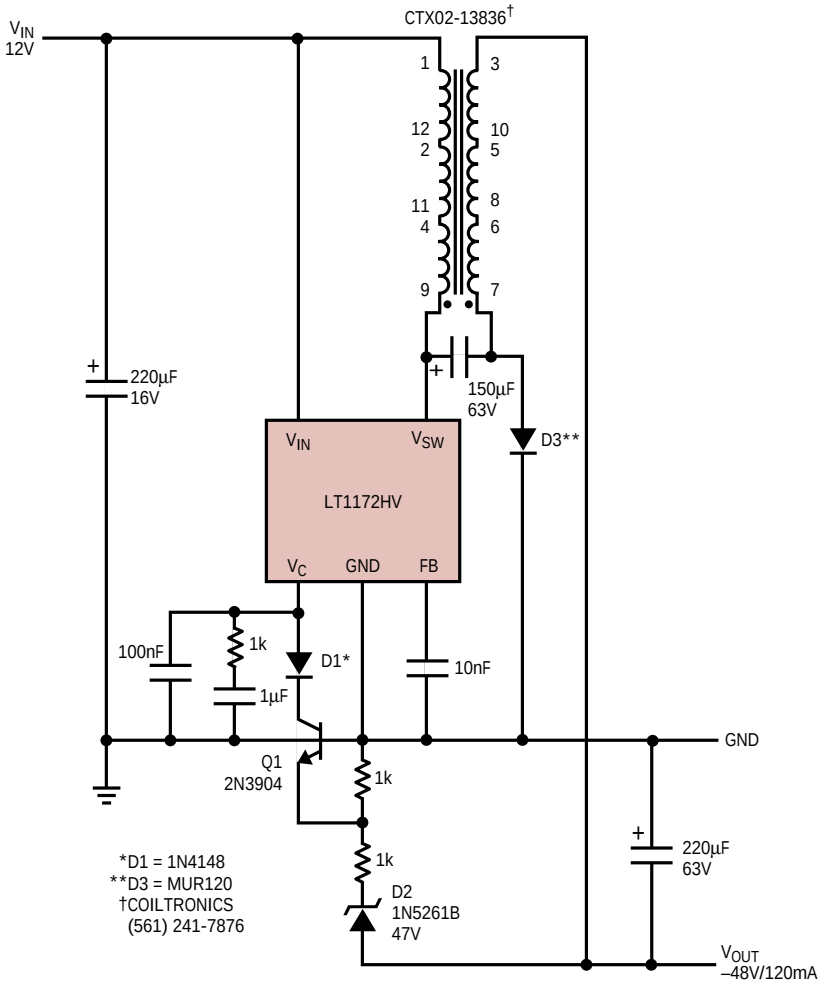
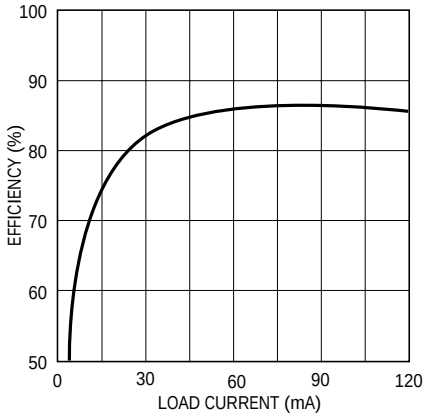
Positive-to-Negative Converter Powers –48V Telecom Circuits

If you're designing a system that interfaces to telecom equipment, chances are you'll need a –48V supply. The circuit in Figure 1 supplies up to 6W at –48V and scales to more than 12W with higher power components. Based on the Cúk topology, the converter exhibits excellent efficiency over a wide range of loading conditions. For lighter loads of up to 60mA, use the LT1172 and a VP-1-series equivalent to the coil shown. For up to 15W, use the LT1171 and a VP-5 equivalent. High voltage versions of the LT1170 family (-HV) allow inputs of up to 20V without exceeding the peak switch-voltage rating.

The LT1171's error amplifier is designed for positive-boost applications, and hence its gain and reference are of the wrong phase and polarity for sensing an inverted output. In this application, the error amplifier is simply bypassed and feedback is applied at the compensation (VC) pin. Zener diode D2 senses the output, pulling down on Q1 and the VC pin, in response to small increases in output voltage. Pulling down on the VC pin reduces peak switch current, and constitutes negative feedback. If the output is a little low, the Zener's diminished feedback signal is overcome by an internal 200µA current source at the VC pin, thereby increasing peak switch current and restoring the output voltage.





Source: Linear Technology Magazine, May 1998
www.linear-tech.com/telecom.html