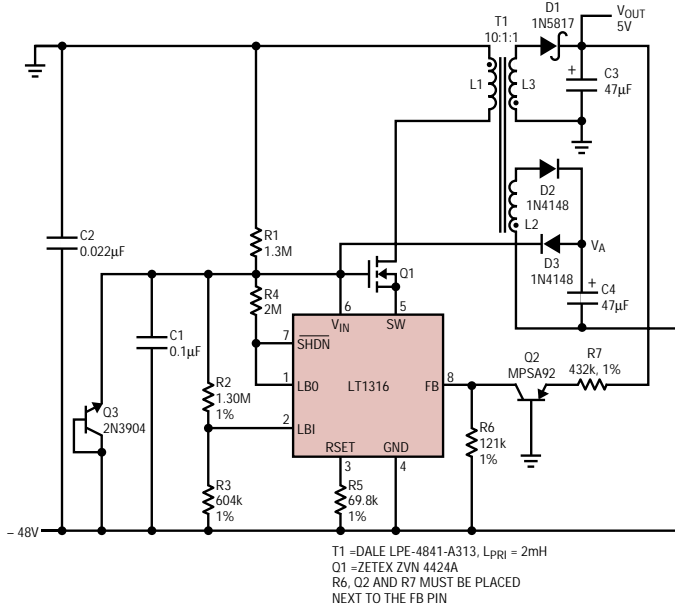


-48V to 5V DC/DC Converter Operates from the Telephone Line

DC/DC converters for use inside the telephone handset require operation from the high source-impedance phone line. Additionally, the CCITT specifications call for on-hook power consumption of 25mW maximum. The DC/DC converter circuit presented here is 70% efficient at an input power of 25mW, providing 5V at 3.4mA. Controlled, low peak switch current ensures that the -48V input line does not experience excessive voltage drops during switching.



Source: Linear Technology Magazine, June 1997
www.linear-tech.com/telecom.html

The circuit shown operates as a flyback regulator with an auxiliary winding to provide power for the **LT1316**. When power is first applied, the LBI pin is low, causing the SHDN pin to be grounded through LBO and placing the part in shutdown mode. During this state, V_{IN} rises at a rate determined by R1 and C1. When LBI reaches 1.17V ($V_{IN} \approx 3.7V$) the LBO pin lets go of SHDN and the part enters the active mode. Once this state is reached, switching action begins and the output voltage begins to increase. As the device switches, the **LT1316** V_{IN} pin draws current out of C1; V_{IN} then decreases sufficiently to trip the low-battery detector, stopping the switching. Start-up proceeds in this irregular fashion until, eventually, the voltage at V_A increases to 5V. (V_A is the same as V_{OUT} , because L2 and L3 have the same number of turns.) After start-up, current is supplied to the **LT1316** from V_A rather than from the -48V rail, increasing efficiency.

For the range of 4mA to 80mA, 70% efficiency or greater is achieved. Less than 80µA quiescent current flows when the converter supplies 0.5mW over the 36V-72V range.

