

Simple and Efficient Way to Provide Three Supply Voltages for Small TFT LCDs

by Bryan Legates

TFT LCDs used in portable devices today typically need three different supply voltages: 5V, 15V, and -10V. One way to generate these three voltages is to use a single DC/DC converter and a large number of external components, but this results in mediocre line and load regulation. The LT1944-1 dual micropower DC/DC converter simplifies LCD power supply design by generating three well-regulated output voltages using a small number of external components. Both DC/DC converters in the

LT1944-1 use a constant-off-time Burst Mode® control scheme to ensure high efficiency at very light load currents. The two converters are independently optimized for high and low step-up ratios: the first converter generates -10V and 15V using a switch current limited at 100mA with a 400ns off-time, while the second converter generates 5V using a switch current limited to 175mA with a 1.5µs off-time. The longer off-time of the second converter ensures a well-controlled inductor current for applications where the step-up ratio is low (i.e. in a Li-Ion to 5V converter or a 2-cell alkaline to 3.3V converter).

The circuit shown in Figure 1 generates three output voltages from a single Li-Ion battery. This power supply can provide 5V at 30mA, 15V at 2.5mA, and -10V at 1mA, making it ideal for the small LCDs found in cellular phones and handheld computers. If needed, the -10V output can be easily changed to a -15V output by connecting the cathode of diode D3 to ground instead of to the 5V output. The LT1944-1 operates from an input voltage of 1.2V to 15V and is capable of producing output voltages up to ±35V, making it a good choice for a wide variety of applications needing multiple output voltages.

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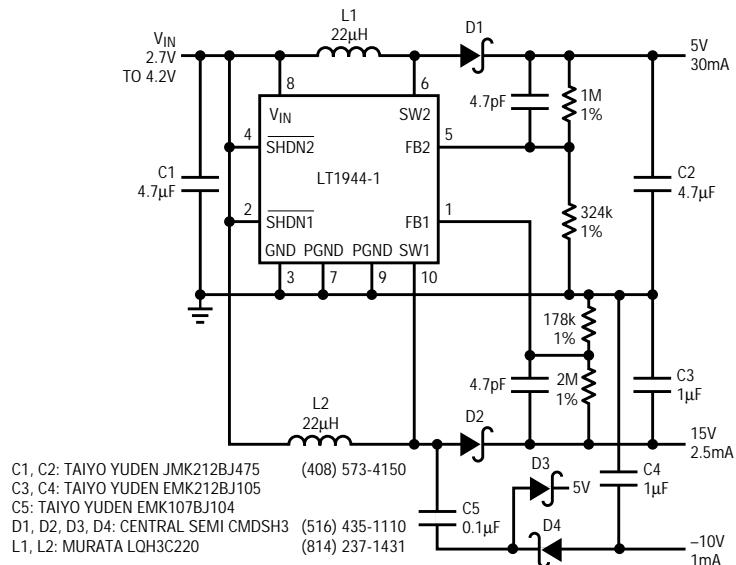


Figure 1. Triple output power supply for LCDs

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