Keywords: battery-powered, stepup dc/dc converters, shutdown, RS-232 transceivers

APPLICATION NOTE 4835

True-Shutdown Circuit

Feb 07, 2011

Abstract: Step-up DC/DC converters have a direct path from input to output (via the inductor and Schottky diode) that makes a full shutdown difficult. This circuit achieves full shutdown for a MAX17112 converter by interposing an external MOSFET between input and output, controlled by an RS-232 transceiver (MAX3384).

A similar version of this article appeared in the June 1, 2010 issue of *EE Times* magazine.

Most battery-powered portable equipment requires one or more step-up dc/dc converters to provide higher supply voltages to other components such as LCD displays. Because power consumption must be minimized, these components are placed in sleep or shutdown mode when not in use. Many step-up DC/DC converters have a shutdown input (SHDN) for this purpose, but they are not capable of complete shutdown because all such converters have an essential current path between input and output via the inductor and Schottky diode. **Figure 1**, however, shows how to realize full (true) shutdown capability for the particular step-up DC/DC converter MAX17112. Power is supplied by two AA cells (2 x 1.5V).
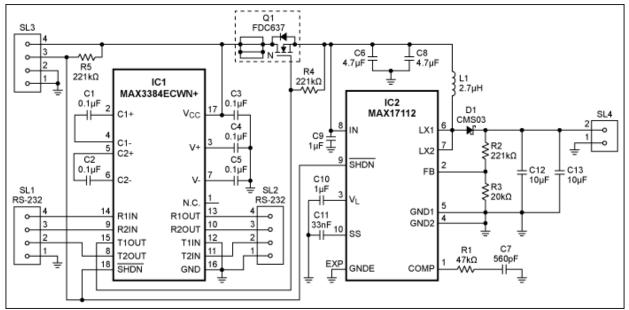

Figure 1. Connecting an RS-232 transceiver (IC1) to this step-up dc/dc converter (IC2) as shown provides the converter with a true-shutdown capability.

Input T1IN of the RS-232 transceiver (MAX3384, IC1) is grounded to ensure a minimum T1OUT = 5.0V. That output (typically 5.4V) is high enough to turn on the n-channel MOSFET Q1. Q1 turns off when a shutdown signal is applied to the SHDN pins of IC1 and IC2. Thus, you realize a true shutdown when OFF by opening the current path between IC2's input and output.

Related Parts		
MAX17112	High-Performance, Step-Up, DC-DC Converter	Free Samples
MAX3384E	±15kV ESD-Protected, 3.0V to 5.5V, Low-Power, Up to 250kbps, True RS-232 Transceiver	Free Samples

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