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APPLICATION NOTE 4444

Single-Pushbutton ON/OFF Power Control

By: Tina Alikahi
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Abstract: This application note presents a single-pushbutton power-control circuit. The design consists of an ON/OFF control circuit comprised of a pushbutton, debouncer, and flip-flop. This circuit toggles the power output voltage by controlling an LDO. The design features the MAX6816 debouncer and MAX6484 LDO.

This design idea appeared in the October 30, 2006 issue of *Portable Design* magazine.

The design of a handheld device today requires that you simplify and reduce the controls to a minimum. A circuit that enables a single pushbutton to turn power on and off can be very useful. **Figure 1** shows a single-pushbutton power-control circuit that consists of only a few small components, and consumes little power.

The normally open (NO) single-contact pushbutton connects to a debouncer (the MAX6816, IC1) that guarantees a single-output edge (rise or fall) each time the button is pushed or released. The MAX6816's output drives the clock input of a flip-flop (IC2) wired as a T-type (toggle) flip-flop. The flip-flop output, in turn, controls a low-dropout (LDO) linear regulator (the MAX6484, IC3). The MAX6484 powers a handheld gadget, which turns on or off each time that the pushbutton is operated. The same circuit can also drive other types of power regulator, if the regulator features a logic-level power-management input.

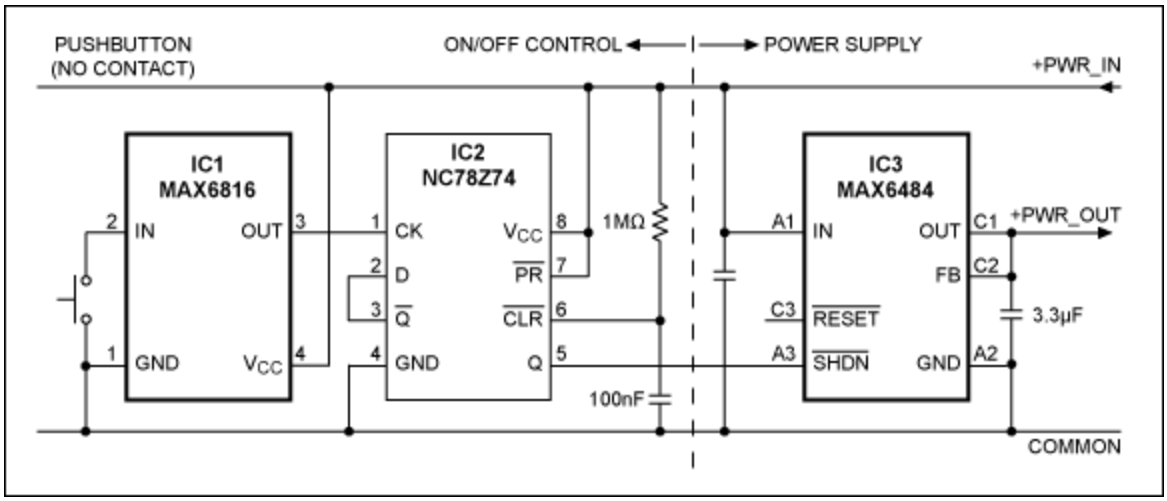

Figure 1. This normally open pushbutton connects to a debouncer, the MAX6816 (IC1) and IC2. This single-pushbutton ON/OFF control circuit lets you toggle the PWR OUT voltage by controlling the MAX6484 LDO (IC3).

The 1MΩ resistor and 100nF capacitor connected to the flip-flop's CLR input ensure that the circuit always powers up in the same state (OFF) when PWR_IN is connected first. The ON/OFF control circuit (pushbutton, debouncer, and flip-flop) operates between 2V and 5.5V; it draws about 3.5µA when the supply voltage is 3.5V. The MAX6816 is available in a 4-pin SOT143 package, IC2 in an MO-187 package, and the MAX6484 in a 6-ball UCSP™ package.

UCSP is a trademark of Maxim Integrated Products, Inc.

Related Parts		
MAX6484	300mA LDO Linear Regulators with Internal Microprocessor Reset Circuit	
MAX6816	±15kV ESD-Protected, Single/Dual/Octal, CMOS Switch Debouncers	Free Samples

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