

DESIGN SHOWCASE

Provide Battery Backup For Pseudo-Static RAMs

Pseudo-static RAMs (PSRAMs) have high density like dynamic RAMs, but unlike DRAMs they are self-refreshing. These qualities make PSRAMs attractive for use in battery-powered microprocessor systems. The drawback in such applications is the PSRAM's minimum supply voltage (4V), which means that a single lithium cell cannot serve as a backup battery without the addition of a stepup converter and other circuitry.

Figure 1 shows a complete battery-backup circuit for PSRAMs. A switchover circuit internal to IC₃ con-

nects V_{CC} to V_{OUT}. If the 5V supply fails, its declining output triggers two events: At 4.75V, LOW LINE (pin 10) goes low and the IC₂ outputs go high, delivering power to IC₁. IC₁ pumps charge onto C₂, causing V_{BATT} to rise toward 4.5V as V_{CC} continues to fall. When V_{CC} < V_{BATT} (which occurs well above 4V) the switchover circuit completes the transition to backup voltage by connecting V_{BATT} to V_{OUT}. Note that IC₁ receives power only when V_{CC} is less than 4.75V.

(Circle 2)

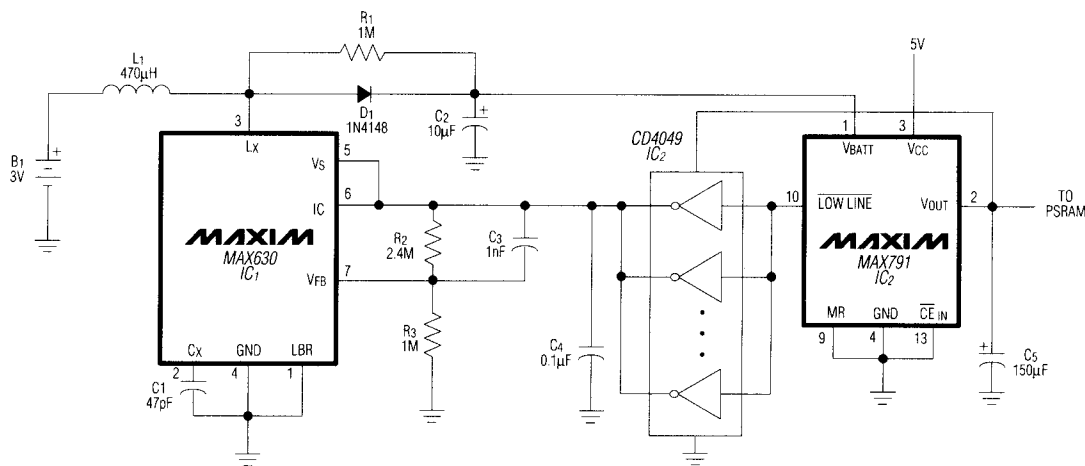


Figure 1. Combining a μ P supervisor (IC₃) with a stepup switching regulator (IC₁) produces a battery-backup circuit capable of generating the uninterrupted, 4V-minimum supply voltage required by pseudo-static RAMs.