APPLICATION NOTE 518: Boost Converter Yields Orderly Shutdown

Some microprocessor (µP) systems require more time for shutdown than is provided by conventional circuits for power-fail detection. Between first warning and the actual loss of power, such systems have extensive "housekeeping" tasks to perform in addition to the memory-write operations that save critical data.

A backup battery and dc-dc regulator can buy extra time for the µP by maintaining VCC at 5V following the initial warning of impending power loss **(Figure 1)**. When VCC falls below 4.65V, µP supervisor IC1 issues a logic-low signal at pin 7. This signal applies a non-maskable interrupt (NMI) to the µP, and (via Q2) turns off Q1 and pulls IC2 out of shutdown.
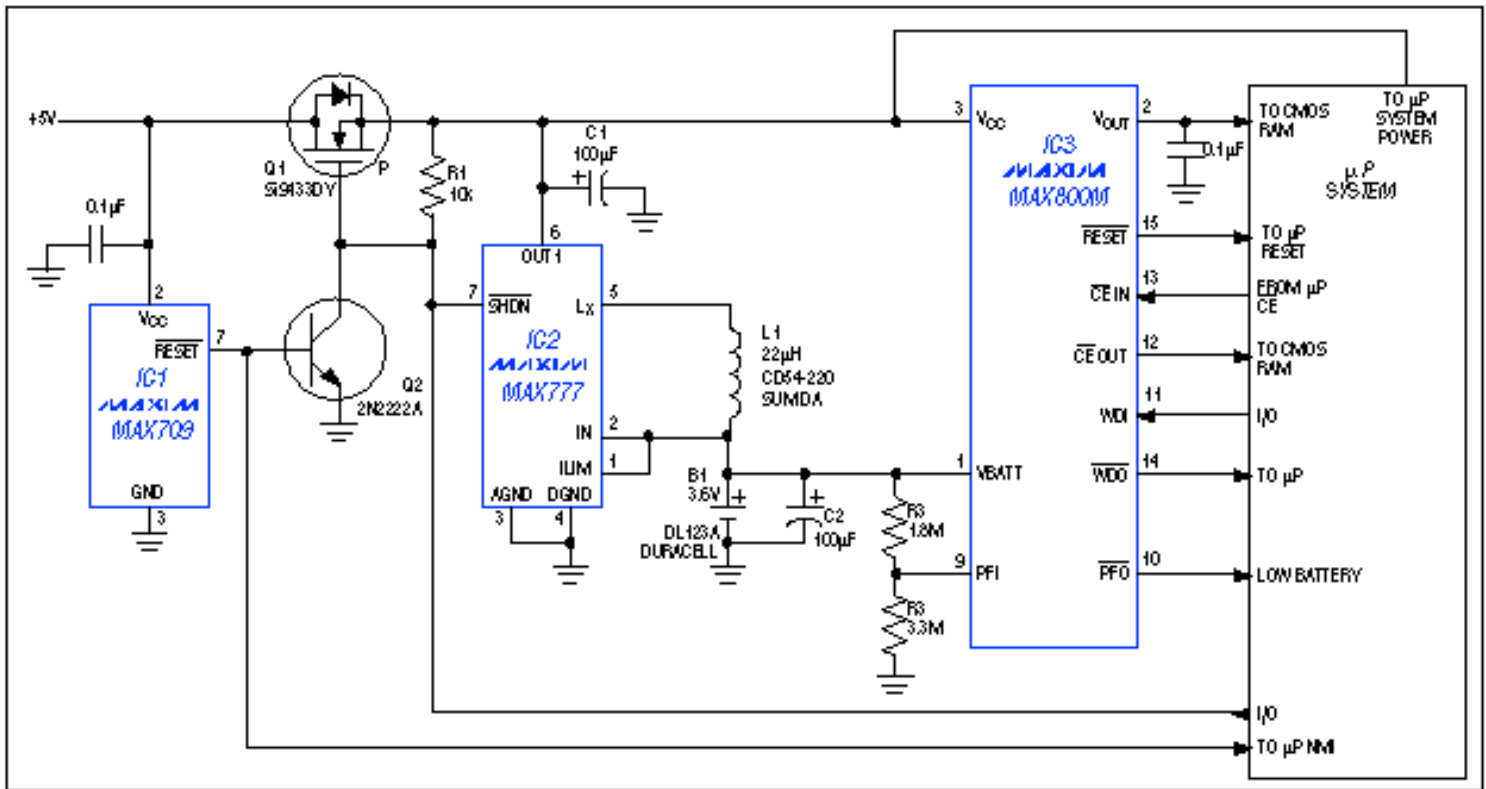

Figure 1. During the brief interval between a low-VCC warning and power fail, this system's boost converter (IC2) derives 5V from the backup battery, giving the µP time to complete its shutdown routine.

As the µP shutdown routine begins, IC2 quickly restores the VCC line to 5V, which supplies as much as 200mA from a 2.5V lithium cell. When the routine ends, the µP shuts down IC2 via an I/O line, allowing a second decline in VCC. At 4.4V, the µP supervisor IC3 enters its normal battery-backup mode. If desired, you can connect separate batteries for the boost converter and for RAM backup.

More Information

MAX800M: QuickView -- Full (PDF) Data Sheet -- Free Samples