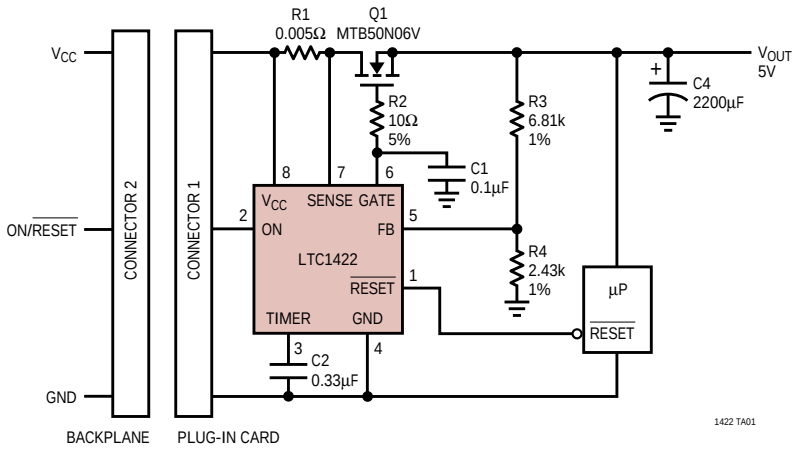
Single 5V Hot Swap with 10A Current Limit

For this application, the single 5V supply is controlled by the N-channel FET in the power path. The MTB50N06V has an $R_{DS(ON)}$ of only 0.025Ω and a drop of only 0.25V at 10A. R1 provides 10A current fault detection and R2 prevents high frequency oscillation. Any fault causing current flow in excess of 10A for more than 10µs will cause the FET to be turned off and a RESET signal to be immediately sent to the processor. A RESET will also be sent if the output voltage drops below its reset threshold of 4.65V set by R3 and R4.

C2 establishes a timing period which has several uses with this device. First, it provides a delay on the ON pin to allow for debounce time upon insertion. Second, it provides a delay after the output voltage rises above its reset threshold prior to releasing the RESET signal. If the voltage falls below the reset threshold before a complete timing cycle then the RESET signal will remain low. The time period is created by a 2µA current source, a comparator and the internal 1.232V reference. The timer period is given by (1.232V x C2)/2µA or 200ms in this application.

5V Hot Swap™



Source: LTC Applications Dept.
www.linear-tech.com/pwrmgmt.html