

Flexible Fault Protection

Many applications require the capability to automatically disconnect power from an operating circuit. Such applications include thermal shutdown of high-voltage power supplies in radar and X-ray systems, shutdown to limit inrush current during power-up or hot-swapping of pc cards, and shutdown to ensure that a card is properly seated before power is applied. In general, a power fault system will keep the power off following the system fault, until it is deliberately reset.

Figure 1 is a flexible circuit that limits current or removes power in response to a command from the user or other fault-indicating signal. It accommodates manual-reset (MR), over-temperature, and interlock-switch inputs. U1, for instance, is a circuit-breaker IC designed to offer protection in hot-swap applications. Residing on either the backplane/host side or the removable-card/remote-device side of the backplane connectors, it guards against start-up faults when a card or board is inserted into a rack or host with the main power supply turned on.

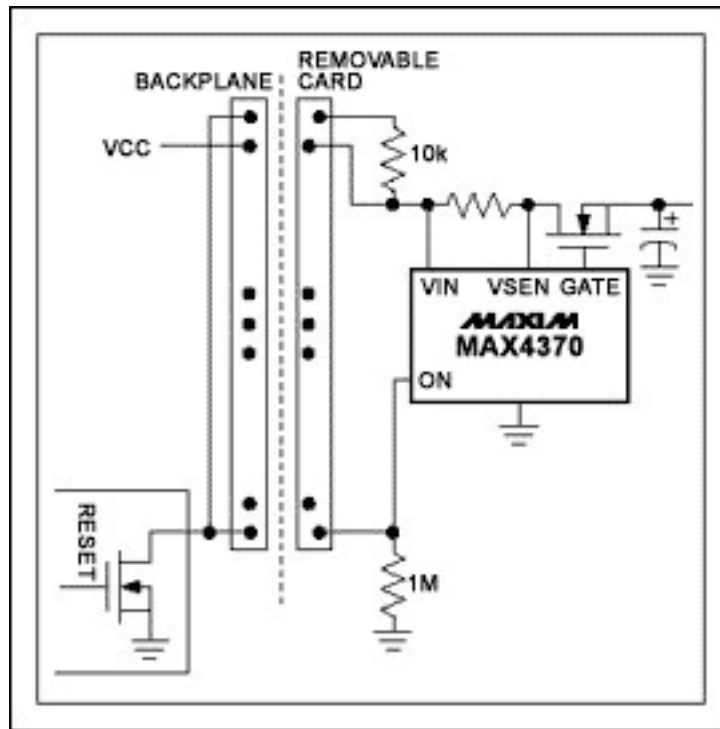


Figure 2a.

OR-able open-drain connection.

A temperature switch (U3) adds thermal protection, and its open-drain output can be connected either directly (wire-OR'd) to other signals on U1's ON pin, or separately, back to the microprocessor. With its TO220 package option, U3 can be bolted to a heat sink, or surface-mounted (SOT23 option) close to known heat-generating sources such as R1, Q1, or the main load. In this circuit U3 provides circuit protection by issuing a power-disconnect signal when the circuit temperature becomes critical. A low-power linear regulator (U4) provides 5V to the low-voltage components U2 and U3, but U4 is not meant to provide system power to the load.

More Information

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