Auto-retry Controller Suits Telecom Applications

In telecom systems such as Radio Link and Point to Point, the point-to-multipoint controller shuts the system off in the event of a fault. When the fault is brief (for instance, a momentary short circuit due to measurement and calibration actions), the controller should restart the system automatically. Using a board or control panel for that purpose can be time-consuming and inefficient. This application note discusses a method for providing auto-retry.

The MAX1637 (IC2 in Figure 1) is a popular device for telecom applications. It offers PWM operation, small size, high MOSFET-drive capability, wide Vin and Vout ranges, and excellent protection against over- and under-voltage faults.

Undervoltage is related to a short circuit: VOUT falls when a short circuit is present and the controller cannot regulate the supply voltage. If that voltage remains below 70% of its nominal value for 6144 clock cycles, IC2 latches and turns both devices off. To restart IC2, you must either switch off the power supply or toggle the SHDN-bar signal.
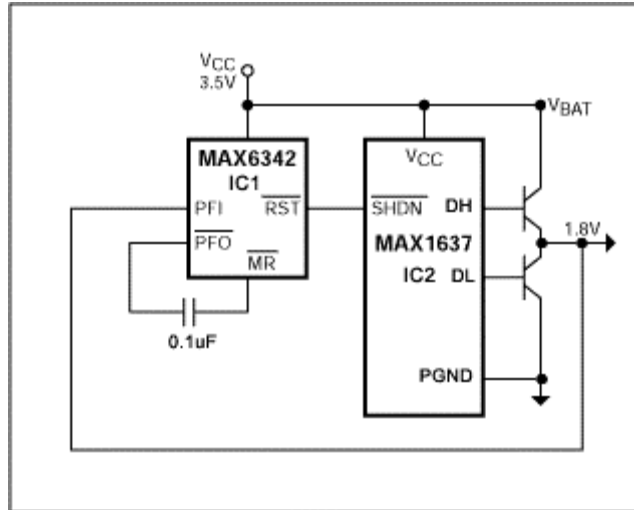

Figure 1. The circuit adds auto-retry capability to IC2, thereby enhancing its usefulness for telecom and other applications.

The microprocessor supervisor (IC1) includes an internal power-fail comparator and manual-reset circuitry (MR). IC1's PFI input detects whether Vout (1.8V) is above the internal reference voltage (1.25V). If Vout falls below 1.25V (due to a short circuit, for instance), the PFO-bar output generates a pulse using the internal 60k pull-up resistor and external 0.1µF capacitor. The pulse drives MR-bar low, causing RST-bar to assert and pull SHDN-bar low. After a timeout delay of 140ms, RESET-bar and SHDN-bar go high, re-enabling IC2. This supervision is also in effect when the supply voltage is first switched on: the 3.5V rail stabilizes after 140mS, causing RST-bar to go high and activate IC2.

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