

Flow Rate Failure Detector

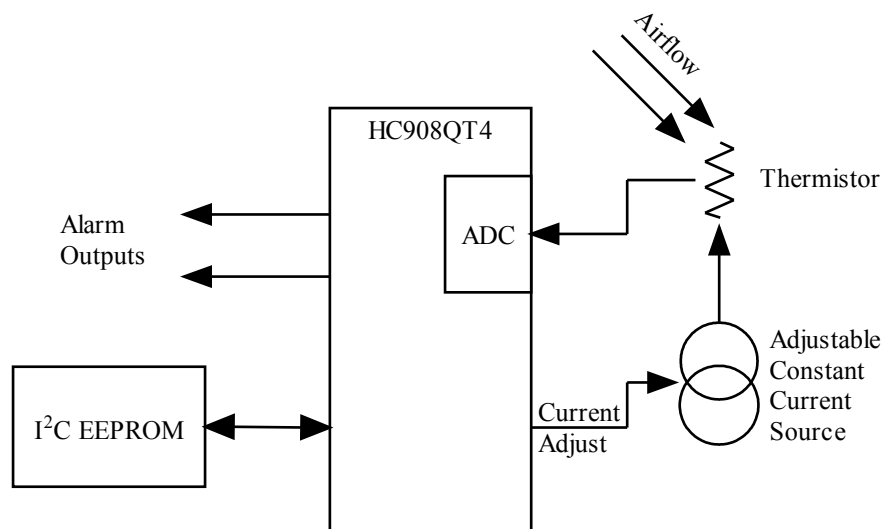
Abstract

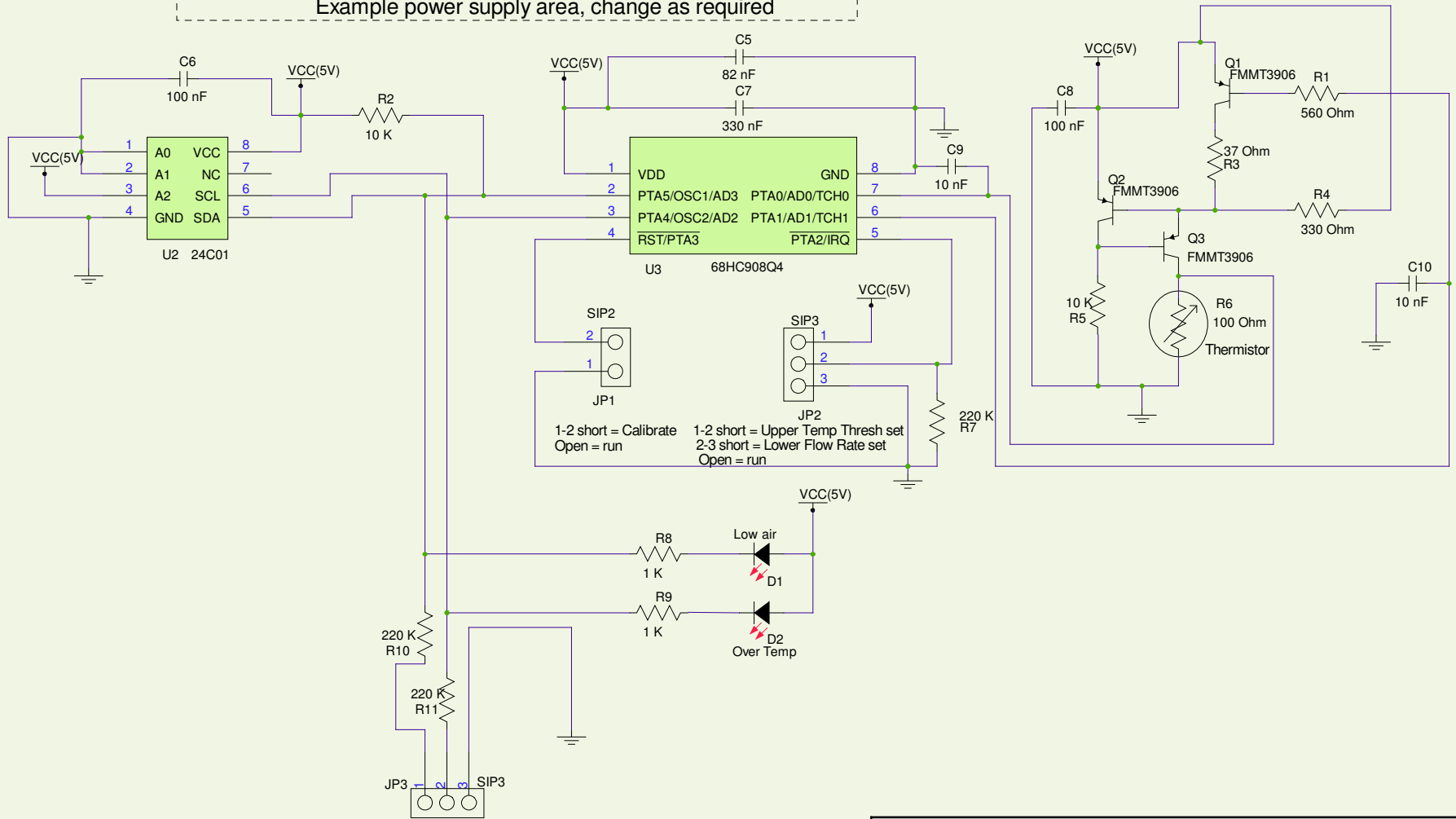
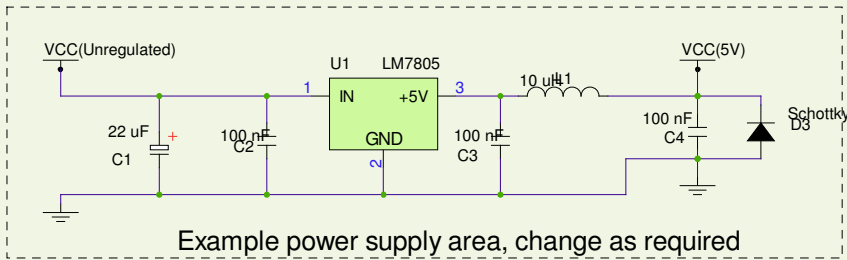
If a temperature sensor on a heat-critical component goes off, it might already be too late. Even if the component is not hurt, the system will likely have to be immediately shut down. Depending on the system, the sudden shutdown could have many different consequences. The most likely in the case of a computer would be lost work or possibly lost profit, but the problem of over-heating is not limited at all to just computers.

This project helps to warn of temperatures that might climb dangerously high before they occur. It does this not by monitoring the temperature and noting the rate of climb, but by actually detecting conditions that will make the temperature climb. These conditions are the air flow rate has dropped too low, and the intake temperature has climbed too high. If the air flow rate has dropped, it likely means a fan or part of the ventilation system has failed. This project can detect conditions that other methods would miss, such as RPM monitoring. Although RPM monitoring would detect a fan failure, it would not detect a clogged filter or broken blades. As well by monitoring the intake air temperature, it is possible to detect that the equipment is operating outside of a safe zone, and it may start to overheat.

The sensor is fairly simple, and consists of a constant current source and a thermistor. The flow-rate is calculated by heating the thermistor up and measuring the drop in temperature caused by the airflow. To measure the air temperature, the thermistor is just used in a 'normal' way.

A MC68HC908QT4 in SOIC-8 package forms the heart of this project. A few transistors and resistors are used for the constant current source, and an external EEPROM stores calibration and threshold data.





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| Title: Air Flow and Temperature Alarm | | |
| Description: Entry into Circuit Cellar's 'Flash Innovation' Contest | | |
| Designed by: F2014 | Date: Wednesday, June 11, 2003 | |
| Checked by: F2014 | Doc. No.: 1 | Revision: 1.0 |
| Approved by: F2014 | Sheet 1 of 1 | Size: A |

