

## U S B P o r t P r o t e c t i o n

### The Design Challenge:

In today's ever-expanding world of information technology, the priority becomes to create devices carrying more information in a smaller package. Not only are computers becoming more compact, they are able to contain bytes once needed for a computer the size of a conference room. The same can be said about the peripherals attached to the computer. Several years ago, all information was carried from a serial or parallel port to the external components of the computer

(i.e. printers, scanners, mouse, keyboards). Today we are able to use the same equipment at higher peripheral-to-PC connection speeds. With the addition of these components comes the need to protect them from current consumption. Two types of current consumption for these components are DC current and transient current. When faced with this problem, what can be used to ensure that these components do not become potential hazards?

### The Application

Overcurrent protection must be implemented at the host and all self-powered hubs for safety reasons, with a way to detect the overcurrent condition. A high-power hub port is required to supply 500 mA per port. A low-power hub port only has to supply 100 mA. If an overcurrent condition occurs on any port, subsequent operation of the Universal Serial Bus (USB) is not guaranteed, and once the condition is removed, it may be necessary to reinitialize the bus as would be done upon power-up. The overcurrent limiting mechanism must be resettable without user mechanical intervention. This requirement is per Universal Serial Bus Specification Revision 2.0 ([www.usb.org](http://www.usb.org)). There are various devices that can be used to limit this overcurrent situation. Some examples are fuses and solid-state switching. MULTIFUSE® PPTC resettable fuses offer the same protection as those devices and are able to automatically reset once the fault is removed, making the device ready for normal operation. Typical MULTIFUSE component values for the PPTC would be the MF-USMD050 or the MF-MSMD110. Actual part numbers for different applications may vary according to the resistance required and operating circuit.

