

# Video Ports: DDC, DVI, M1, VGA

## Application Overview

3

### Problem/Solution

More and more software and hardware standards are specifying configurations that support the plug-and-play concept and energy-saving features such as those outlined in the EnergyStar program. The Display Data Channel Standard (DDC) promoted by the Video Electronics Standards Association is one such standard. To meet regulatory requirements, video interfaces must have some method of interrupting or limiting current in the event of an overload or a short-circuit. Using a PolySwitch resettable device in series between the connector and host power supply can provide an effective solution, while simultaneously lowering manufacturers' warranty costs.

The Digital Visual Interface (DVI) specification incorporates a subset of the DDC for operation between a DDC compliant host and DDC compliant monitor. The DDC level support required in the DVI specification is DDC2B, which means that support of the 5V signal pin is required.

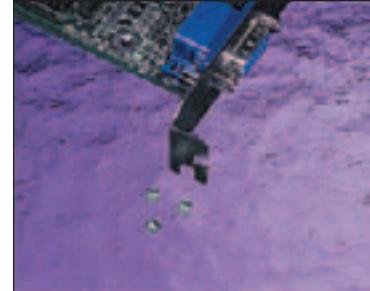
The M1 standard is a modification of DVI. M1 incorporates a USB connection to the display device as well as the addition of a power pin on the display side connector.

### Typical Protection Requirements

Devices that comply with the DDC host system standard typically provide supply voltage on pin #9 of the standard 15-pin VGA connector. The voltage is 5V  $\pm 5\%$  and supplies a minimum of 300mA to a maximum of 1A.

For DVI compliant systems, pin #14 carries the 5V power at a maximum of 50mA. In a short-circuit condition, the current draw can be many times that specified by the standard and the port should be protected.

For M1 compliant devices the M1 peripheral has an additional power pin imbedded in its connector assembly. This pin is a 5V pin that can support up to 2A of current. Circuit protection is required if this pin is active. USB protection may also be required for M1 peripherals. (See the USB application note for details.)



### Typical Agency Approval Requirements

If the manufacturer is required to meet UL60950 or IEC60950 specifications, the current at the connector must be limited to 5A in less than 60 seconds. By limiting current during a short-circuit situation, a PolySwitch device will help the manufacturer meet this requirement.

### Device Selection

The devices that are typically used in this application are from the microSMD, miniSMD, nanoSMD, SMD, and RUSB series.

**Figure 1. Video Card & M1 Peripherals Circuit Protection**

