

Pericom's PI5C6800 Bus Switch in PCI Hot Plug Applications

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There are a number of real-time systems designed to run continuously such as telephone control boards, servers, security systems and air line booking networks. These systems can not be turned off for any reason requiring capability to insert and remove any module or card without disrupting the real-time information. Most of these systems use PCI as the backplane bus. The logic circuits used in these systems and the plug-in cards do not provide isolation during insertion thus causing system error. Pericom's PI5C6800 provides the solution to this problem by providing isolation during insertion. This is particularly applicable to PCI based systems.

Figure 1 shows the logic diagram of the PI5C6800. The PI5C6800 is a 10 bit 2 port (A-B) bus switch with low on-state resistance, near zero propagation delay and ultra low quiescent power (0.2µA typically). The PI5C6800 creates no additional propagation delay. The PI5C6800 also precharges the B port to a user selectable bias voltage (BIASV) to minimized live insertion noise.

The PI5C6800 is turn on by a single enable (ON#) input. When ON# is LOW, the switch is on and port A connected to port B. When ON# is HIGH, the switch between port A and port B is open and the B port is precharged to BIASV through the equivalent of a 10K ohm resistor.

Figure 2 shows the basic block diagram of the PCI hot-plug application using PI5C6800. The PCI signals are connected

to the PCI slots through the bus switch PI5C6800, thus providing isolation. Since the PI5C6800 is a 10 bit switch, you need several of PI5C6800 for each PCI slot. To provide isolation at the time of insertion or removal of modules, the bus switch is activated or deactivated by the single enable input, which is generated by the hot-plug controller. This hot-plug controller generates the necessary control signals when insertion/deinsertion is detected externally.

Figure 3 shows detail circuit diagram of PCI hot-plug application. Figure 3 shows that PCI signals are tapped from the PCI bus and connected to port A of all the bus switch for the same signal. All the PI5C6800 are controlled by the hot-plug controller. Once insertion is detected, hot-plug controller generates the ON# signal (LOW) which activates the switch and port A gets connected to port B. When deinsertion is detected externally, hot-plug controller generates ON# signal (HIGH) and all the outputs (port B) are precharged by bias voltage (BIASV).

When adding a card to a live system, the connector must be designed to provide quick and solid grounds followed by signals and power connection. To minimize current surges use extended ground pins on both the edges, slightly shorter pins with output enables and other signals and the shortest pins for the power in the middle of the connector. For detail information on connector design, capacitance effects and implements please refer to Application note 3.

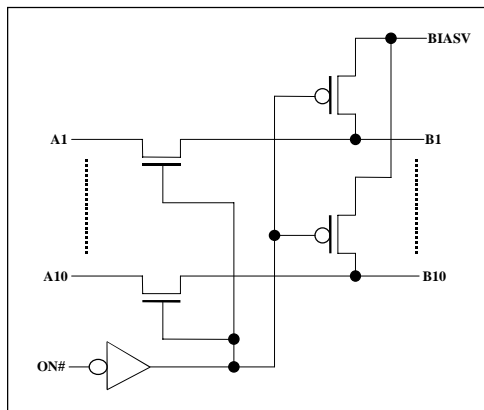


Figure 1. PI5C6800 Logic Diagram

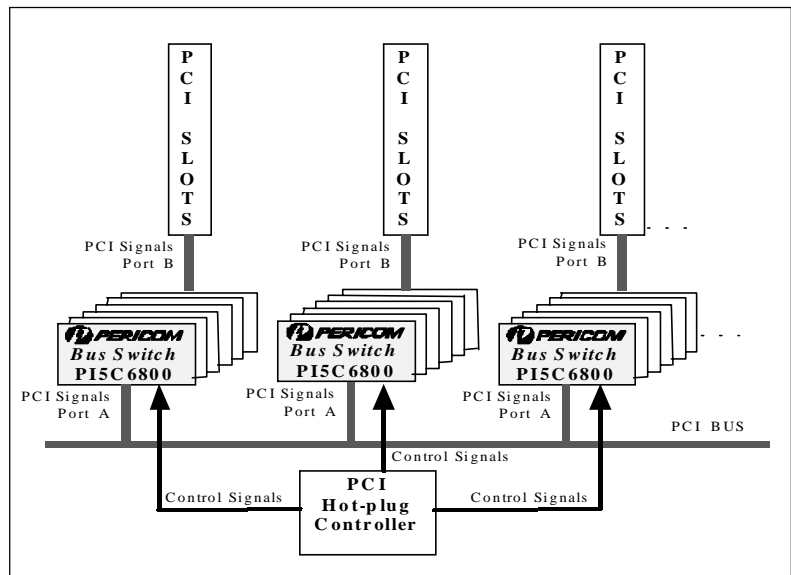


Figure 2. PCI Hot-Plug Application Block Diagram using PI5C6800

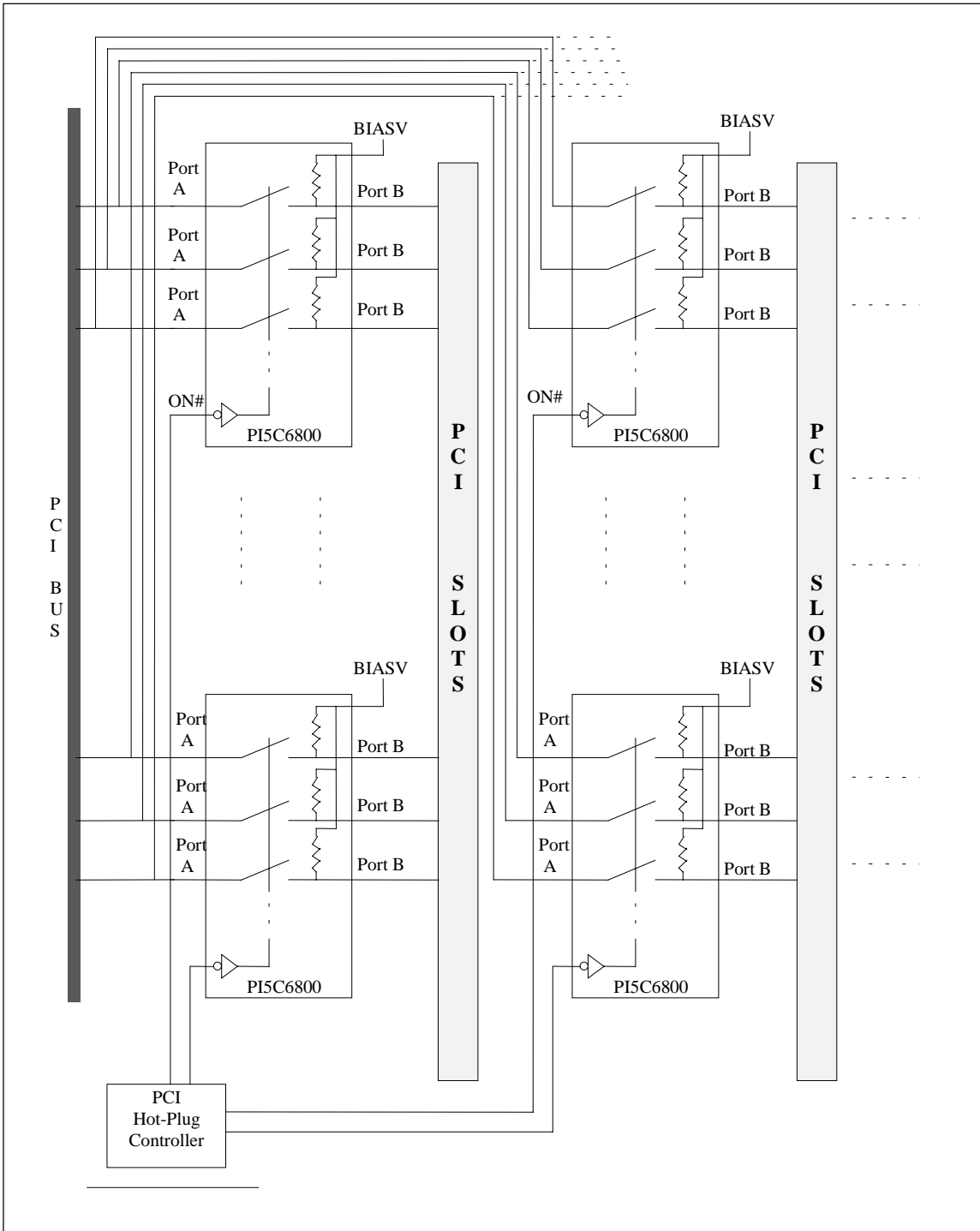


Figure 3. PI5C6800 in PCI Hot-Plug Application