



# ***PD6729 — Routing PCMCIA Interrupts in a PCI-Based System***

**Application Note**

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***May 2001***



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# Contents

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1.0	Introduction .....	5
2.0	Routing PCMCIA Interrupts in a PCI-Based System .....	6

## Figures

1	A Common Mapping of PD6729 Interrupt Pins to System Interrupt Lines .....	6
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## 1.0 Introduction

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The PD6729 is a single-chip PCMCIA interface controller capable of controlling two PCMCIA or compact Flash sockets, respectively. It is designed for use in embedded applications and notebook systems where reduced form factor and low power consumption are critical design objectives.

Current typical application examples include:

- Routers
- Access network servers
- PBXs
- Vending machines
- Portable handheld systems
- Data acquisition systems
- Settop boxes
- Integrated access devices
- DSLAMs
- Terminal servers
- Point of Sale terminals
- Navigation systems
- Measurement equipment

With the PD6729, a complete dual-socket PCMCIA solution with power-control circuitry can occupy less than 2 square inches (13 square centimeters) of board space.

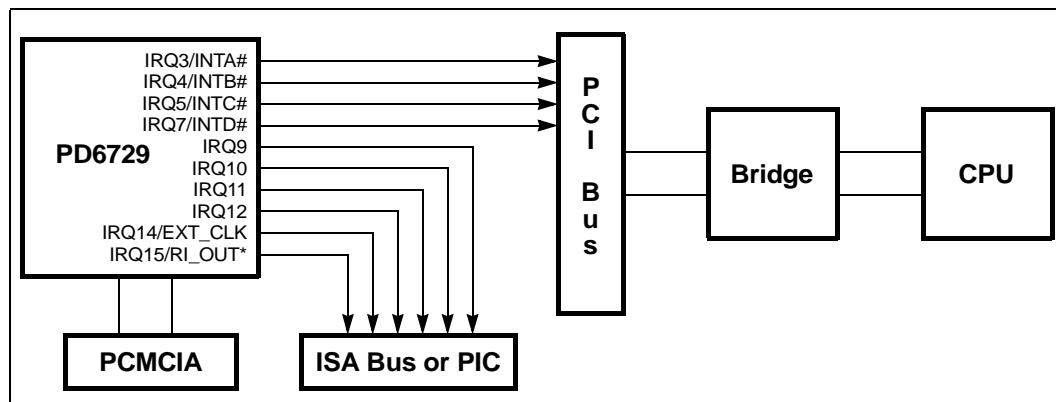
The PD6729 controller is completely compatible with the standards of PCMCIA (Personal Card Memory International Association) Release 2.0 Standard as well as JEIDA (Japan Electronic Industry Development Association) Version 4.1 Standard, and PCI 2.1. The PD6729 controller also offers special power-saving features such as Automatic Low-power Dynamic Mode and Suspend Mode. The PD6729 is a true mixed-voltage device that can operate at +5 volts, +3.3 volts, or a combination of these at various interfaces. The controllers have full internal buffering and require no additional circuitry to interface to the PCI Bus or to PCMCIA sockets.

## 2.0 Routing PCMCIA Interrupts in a PCI-Based System

Current PCMCIA software is programmed to expect management and general-control interrupts to occur on standard ISA-type interrupt lines. Typical PC/AT-compatible system hardware and software also assume certain IRQ activation for specific peripherals. For example, some ISRs (Interrupt Service Routines) for serial peripherals assume the activation of specific IRQ lines for the COM port used. Some ISRs expect a fax/modem card to use either the COM1 port and activate the IRQ4 interrupt line or use COM2 and activate IRQ3. Some ISRs also expect certain cards to use COM3 and activate IRQ4 or use COM4 and activate IRQ3.

The PD6729 PC Card (PCMCIA) controller has 10 pins available for interrupt routing. A common connection is shown in Figure 1.

**Figure 1. A Common Mapping of PD6729 Interrupt Pins to System Interrupt Lines**



**Note:** IRQ14/EXT\_CLK and IRQ15/RI\_OUT\* have two functions on the PD6729.

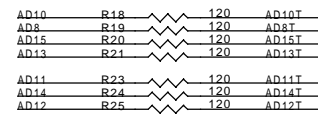
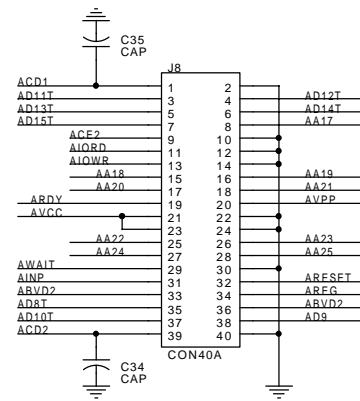
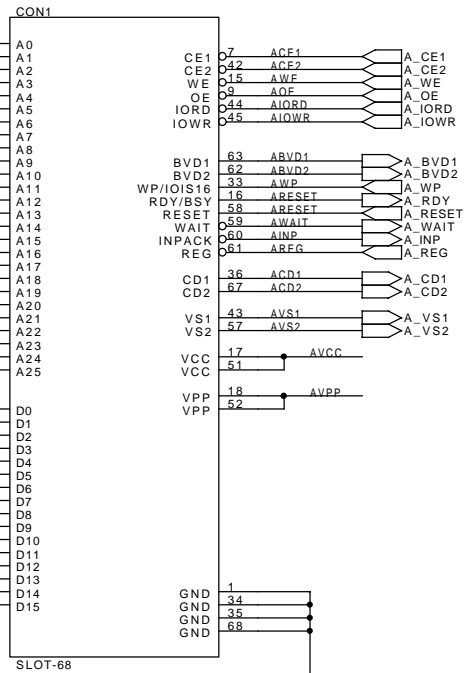
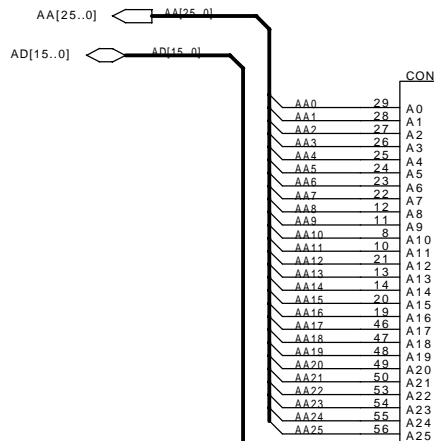
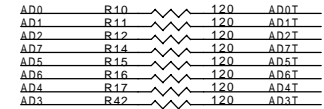
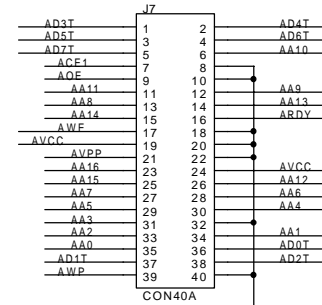
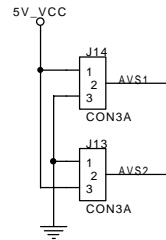
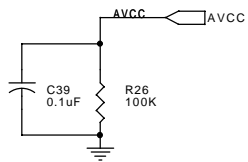
The PD6729 allows custom routing of interrupt signals from the PD6729 pins to the PCI bus. Connections can be made to INTA#, INTB#, INTC#, or INTD# on the PCI bus. Refer to the PD6729 data sheet for detailed information.

The routing of IRQ lines on the bridge side, however, is highly system-dependent. If the correct IRQ is not activated on the PIC (Peripheral Interrupt Controller) inside the bridge chip, it is possible that the wrong ISR could be activated by the CPU, and the PCMCIA card would not function correctly.

One way to alleviate the current interrupt routing problem during the evaluation process is to connect the IRQ pins on the PD6729 directly to the corresponding IRQ line on the ISA bus. This can easily be accomplished on a motherboard for planar implementation of the PD6729. Alternately, the IRQ lines can be routed from the PD6729 via a cable to a companion ISA plug-in card. (This latter scheme is the one used by the PD6729 demonstration boards.) The polarities of the interrupt signals (IRQ on ISA and INT# on PCI) must be considered. However, physical connection to the IRQ lines on the ISA bus may not be practical on some PCI motherboards, and on some system boards the ISA expansion bus may not be available.

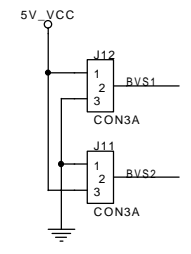
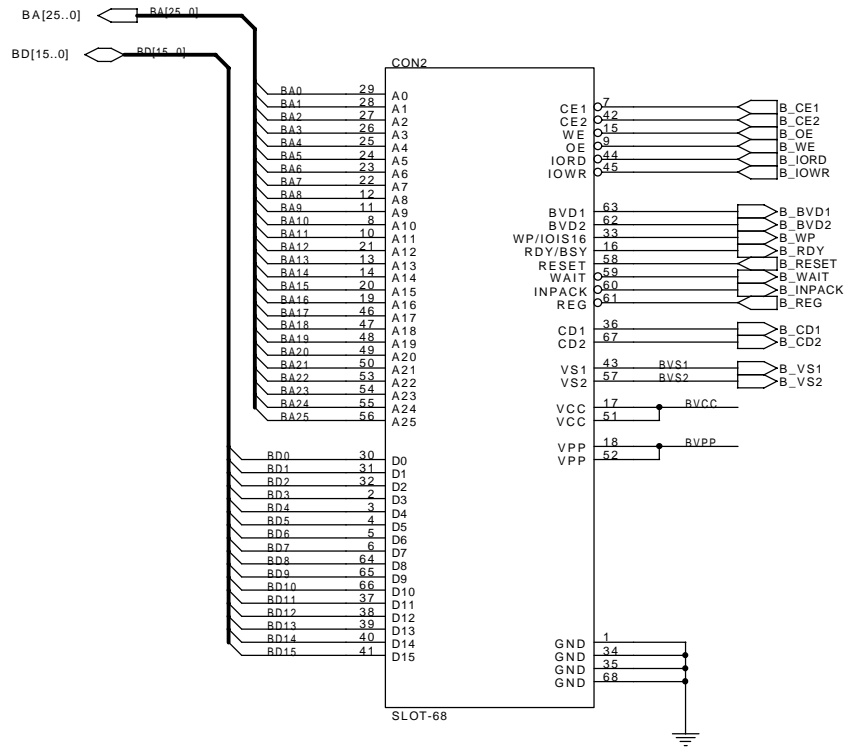
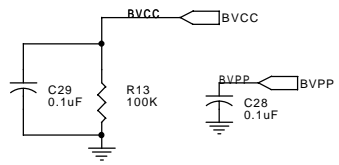
Design engineers should be careful with their system implementation to avoid problems with interrupts. It should be noted, however, that the interrupt routing mostly depends on the system design and is often beyond the scope of PCMCIA implementation.



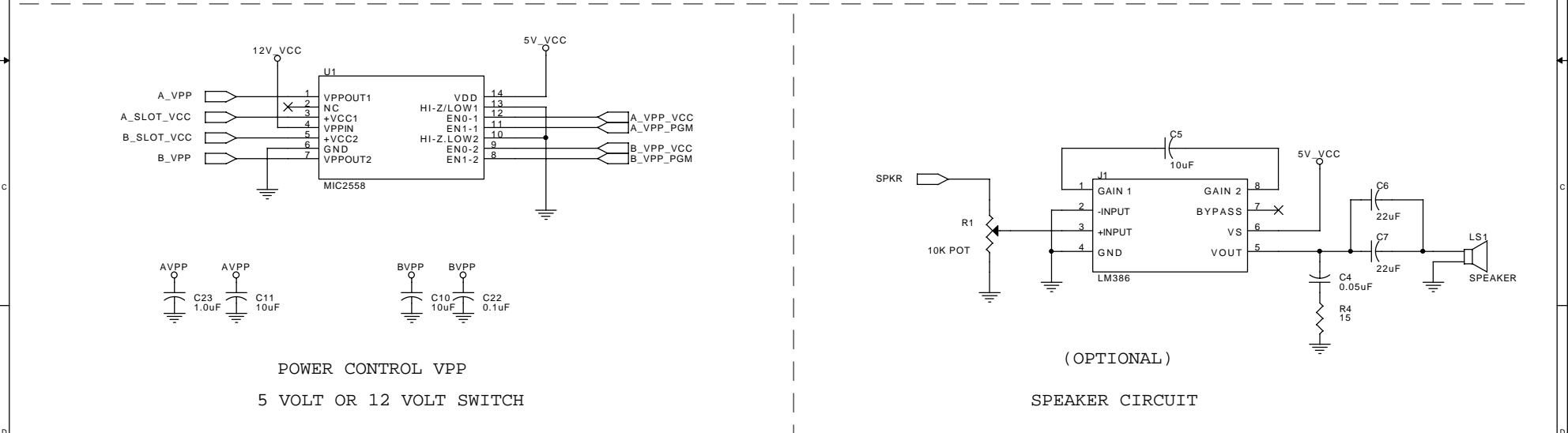
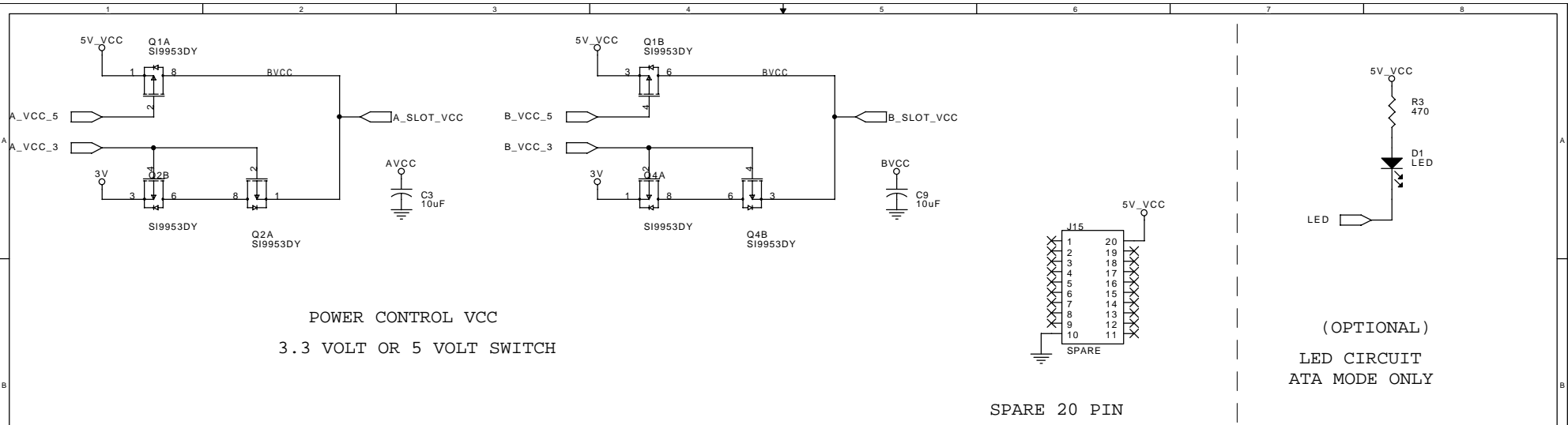


Cirrus Logic, Inc.		
Title	PCMCIA Socket A Interface	
Size	Document Number	Rev
B	CL-PD6729 DEMO BOARD	1.0
Date:	Tuesday, December 05, 1995	Sheet 2 of 5





Cirrus Logic, Inc.		
Title PCMCIA Socket B Interface		
Size B	Document Number CL-PD6729 DEMO BOARD	Rev 1.0
Date: Tuesday, December 05, 1995 Sheet 3 of 5		

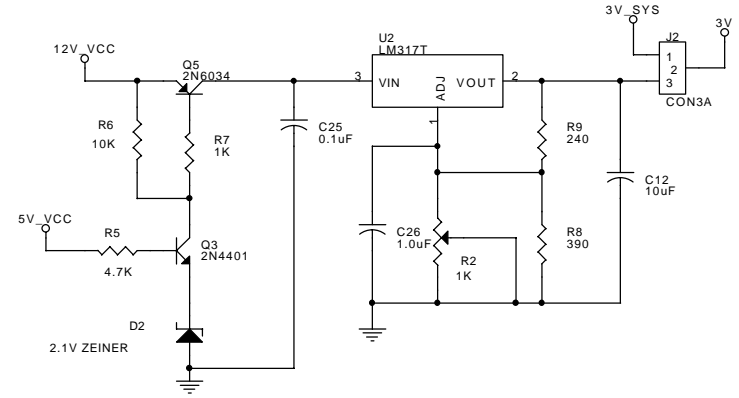
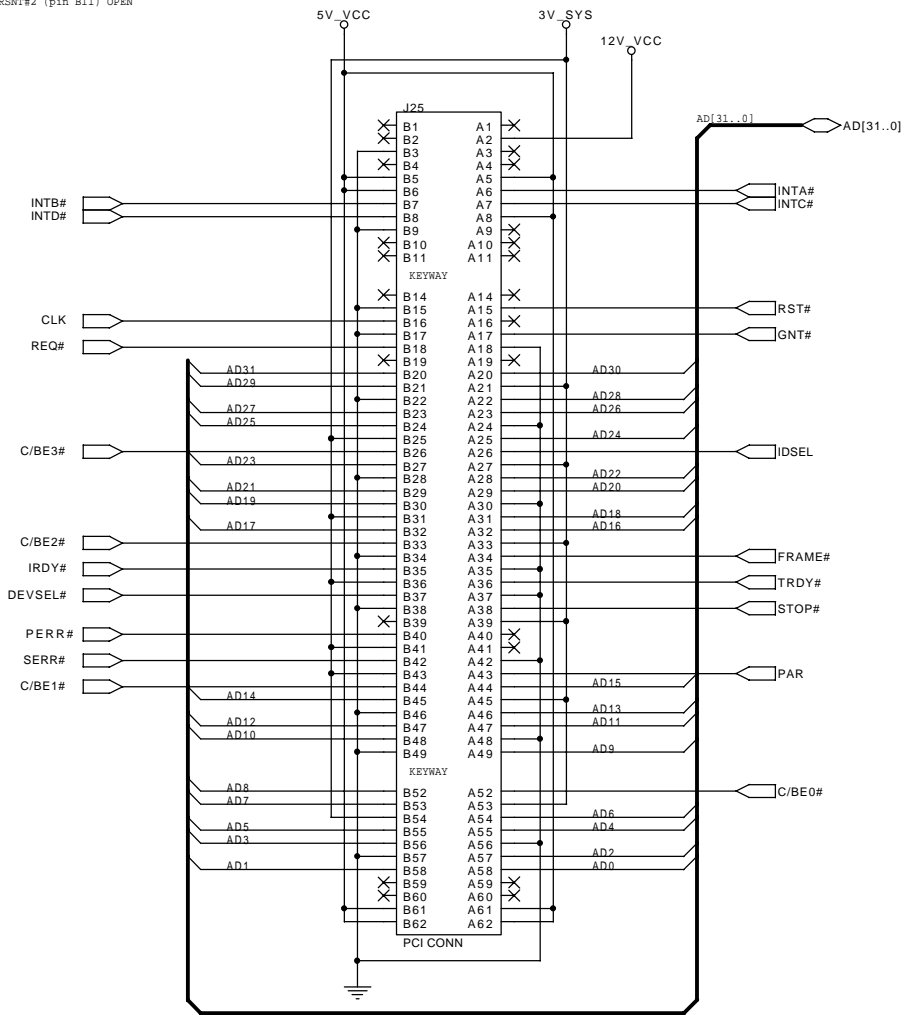


Note: The CL-PD6720-A-DM1-2 EVAL board uses the 12V supplied from the ISA bus as the 12V input for the VPP circuit. PCMCIA 2.01 specification requires a VPP voltage level of 12V +/- 5%. In actual applications we suggest that the designer use a 12V regulator circuit to guarantee that the VPP voltage is within the PCMCIA 2.01 specification.

CIRRUS LOGIC, INC.		
Title	POWER CONTROL LOGIC	
Size B	Document Number	Rev
	CL-PD6729 DEMO BOARD	1.1
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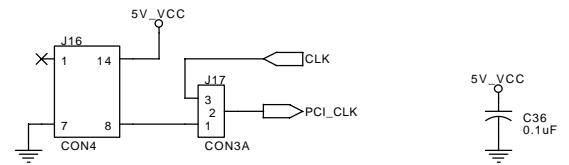
ADD IN CONFIGURATION 25 WATT MAX.

PRSN1#1 (pin B9) GND  
 PRSN1#2 (pin B11) OPEN

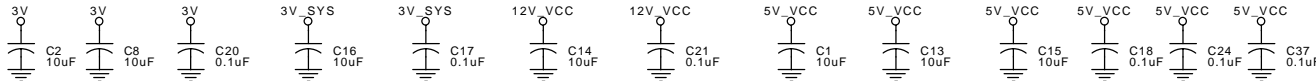


NOTE: INSTALL EITHER R2 OR R8  
 DO NOT INSTALL BOTH RESISTORS

### 3.3V Volt Regulator



### EXTERNAL CLOCK SOURCE



CIRRUS LOGIC, INC.		
Title	ISA BUS INTERFACE	
Size B	Document Number	Rev
	CL-PD6729 DEMO BOARD	1.0
Date:	Tuesday, December 05, 1995	Sheet 5 of 5