PC Card and OHCI Controller

FEATURES

- **Ability to wake from $D3_{hot}$ and $D3_{cold}$**
- **Fully compatible with the Intel 430TX (Mobile Triton II) chipset**
- **A 208-pin low-profile QFP (PDV) or 209-ball MicroStar BGA™ ball grid array (GHK) package**
- **3.3-V core logic with universal PCI interfaces compatible with 3.3-V and 5-V PCI signaling environments**
- **Mix-and-match 5-V/3.3-V 16-bit PC Cards and 3.3-V CardBus Cards**
- **Single PC Card or CardBus slot with hot insertion and removal**
- **Burst transfers to maximize data throughput on the PCI bus and the CardBus bus**
- **Parallel PCI interrupts, parallel ISA IRQ and parallel PCI interrupts, serial ISA IRQ with parallel PCI interrupts, and serial ISA IRQ and PCI interrupts**
- **Serial EEPROM interface for loading subsystem ID and subsystem vendor ID**
- **Pipelined architecture allows greater than 130 Mbit/s sustained throughput from CardBus-to-PCI and from PCI-to-CardBus**
- **Interface to parallel single-slot PC Card power-switch interfaces like the TI ™TPS2211 device**
- **Up to five general-purpose I/Os**
- **Programmable output select for $\overline{\text{CLKRUN}}$**
- **Five PCI memory windows and two I/O windows available to the 16-bit PC Card socket**
- **Two I/O windows and two memory windows available to the CardBus socket**
- **Exchangeable Card Architecture (ExCA) compatible registers are mapped in memory and I/O space**
- **Compatibility with Intel 82365SL-DF and 82365SL registers**
- **Distributed DMA (DDMA) and PC/PCI DMA**
- **16-bit DMA on the PC Card socket**
- **Ring indicate, $\overline{\text{SUSPEND}}$, PCI $\overline{\text{CLKRUN}}$, and CardBus $\overline{\text{CLKRUN}}$**
- **Socket-activity LED pins**
- **PCI bus lock ($\overline{\text{LOCK}}$)**
- **Advanced submicron, low-power CMOS technology**
- **Internal ring oscillator**
- **OHCI link function designed to IEEE *1394 Open Host Controller Interface (OHCI) Specification***
- **Implements PCI burst transfers and deep FIFOs to tolerate large host latency**
- **Supports physical write posting of up to three outstanding transactions**
- **OHCI link function is compliant with IEEE 1394-1995 and compatible with IEEE 1394a-2000**
- **Supports serial bus data rates of 100, 200, and 400 Mbits/s**
- **Provides bus-hold buffers on the PHY-Link I/F for low-cost single-capacitor isolation**

DESCRIPTION

The Texas Instruments PCI4410A device is an integrated single-socket PC Card controller and IEEE 1394 Open HCI host controller. This high-performance integrated solution provides the latest in both PC Card and IEEE 1394 technology.

The PCI4410A device is a dual-function PCI device compliant with the *PCI Local Bus Specification*. Function 0 provides the independent PC Card socket controller compliant with the *PC Card Standard*. The PCI4410A device provides features that make it the best choice for bridging between the PCI bus and PC Cards, and supports either 16-bit or CardBus PC Cards in the socket, powered at 5 V or 3.3 V, as required.

All card signals are buffered internally to allow hot insertion and removal without external buffering. The PCI4410A device is compatible with the register of the Intel™ 82365SL–DF and 82365SL ExCA controllers. The PCI4410A internal data-path logic allows the host to access 8-, 16-, and 32-bit cards using full 32-bit PCI cycles for maximum performance. Independent buffering and a pipeline architecture provide an unsurpassed performance level with sustained bursting. The PCI4410A device can be programmed to accept posted writes to improve bus utilization.

Function 1 of the PCI4410A device is compatible with IEEE 1394a-2000 and the latest 1394 open host controller interface (OHCI) specifications. The chip provides the IEEE 1394 link function and is compatible with data rates of 100, 200, and 400 Mbits/s. Deep FIFOs are provided to buffer 1394 data and accommodate large host bus latencies. The PCI4410A device provides physical write posting and a highly tuned physical data path for SBP-2 performance. Multiple-cache line burst transfers, advanced internal arbitration, and bus-holding buffers on the PHY/Link interface are other features that make the PCI4410A device the best-in-class 1394 OHCI solution.

The PCI4410A device provides an internally buffered zoomed-video (ZV) path. This reduces the design effort of PC board manufacturers to add a ZV-compatible solution and ensures compliance with the CardBus loading specifications.

Various implementation-specific functions and general-purpose inputs and outputs are provided through eight multifunction terminals. These terminals present a system with options in PC/PCI DMA, PCI $\overline{\text{LOCK}}$ and parallel interrupts, PC Card activity indicator LEDs, and other platform-specific signals. ACPI-compliant general-purpose events can be programmed and controlled through the multifunction terminals, and an ACPI-compliant programming interface is included for the general-purpose inputs and outputs.

The PCI4410A device is compliant with the latest PCI Bus Power Management Specification, and provides several low-power modes that enable the host power system to further reduce power consumption. The *PC Card (CardBus) Controller* and *IEEE 1394 Host Controller Device Class Specifications* required for Microsoft OnNow™ power management are supported. Furthermore, an advanced complementary metal-oxide semiconductor (CMOS) process achieves low system power consumption.

Unused PCI4410A device inputs must be pulled to a valid logic level using a 43-kΩ resistor.

NOTE:

This product is for high-volume PC applications only. For a complete datasheet or more information contact support@ti.com.

PACKAGING INFORMATION

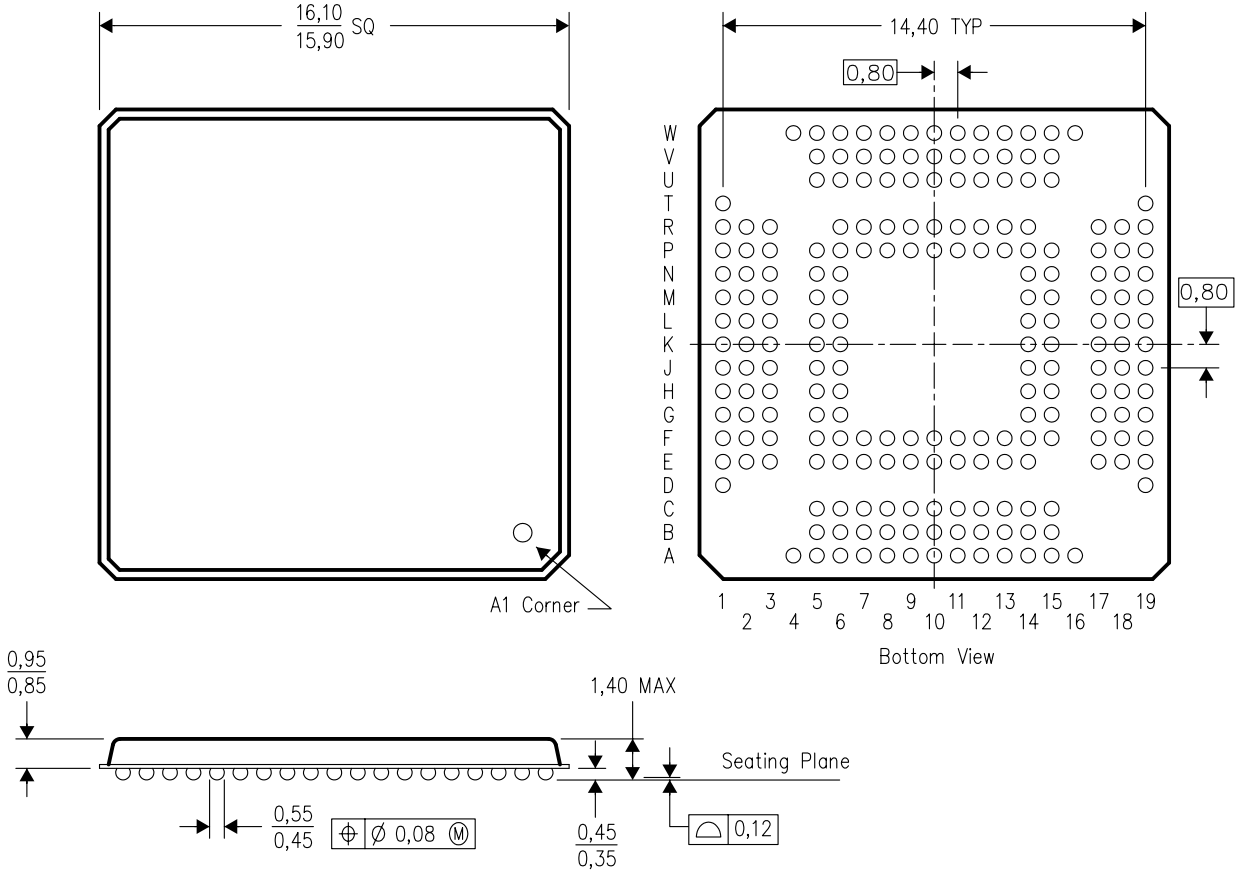
Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
PCI4410AGHK	ACTIVE	BGA MICROSTAR	GHK	209		TBD	Call TI	Call TI
PCI4410APDV	ACTIVE	LQFP	PDV	208		TBD	Call TI	Call TI

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

GHK (S–PBGA–N209) PLASTIC BALL GRID ARRAY



NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.

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