PCI7621/PCI7611
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SLLA248 – JULY 2006

Dual/Single Socket CardBus and UltraMedia Controller With Integrated 1394a-2000 OHCI Two-Port PHY/Link-Layer Controller With Dedicated Flash Media Socket

FEATURES

- *PC Card Standard* 8.1 compliant
- *PCI Bus Power Management Interface Specification* 1.1 compliant
- *Advanced Configuration and Power Interface (ACPI) Specification* 2.0 compliant
- *PCI Local Bus Specification* Revision 2.3 compliant
- PC 98/99 and PC2001 compliant
- Windows Logo Program 2.0 compliant
- *PCI Bus Interface Specification for PCI-to-CardBus Bridges*
- Fully compliant with provisions of IEEE Std 1394-1995 for a high-performance serial bus and IEEE Std 1394a-2000
- Fully compliant with *1394 Open Host Controller Interface Specification* 1.1
- 1.5-V core logic and 3.3-V I/O cells with internal voltage regulator to generate 1.5-V core V_{CC}
- Universal PCI interfaces compatible with 3.3-V and 5-V PCI signaling environments
- Supports PC Card or CardBus with hot insertion and removal
- Supports 132-MBps burst transfers to maximize data throughput on both the PCI bus and the CardBus
- Supports serialized IRQ with PCI interrupts
- Programmable multifunction terminals
- Many interrupt modes supported
- Serial ROM interface for loading subsystem ID and subsystem vendor ID
- ExCA-compatible registers are mapped in memory or I/O space
- Intel 82365SL-DF register compatible
- Supports ring indicate, $\overline{\text{SUSPEND}}$, and PCI $\overline{\text{CLKRUN}}$ protocols
- Provides VGA/palette memory and I/O, and subtractive decoding options, LED activity terminals
- Fully interoperable with FireWire™ and i.LINK™ implementations of IEEE Std 1394
- Compliant with *Intel Mobile Power Guideline 2000*
- Full IEEE Std 1394a-2000 support includes: connection debounce, arbitrated short reset, multispeed concatenation, arbitration acceleration, fly-by concatenation, and port disable/suspend/resume
- Power-down features to conserve energy in battery-powered applications include: automatic device power down during suspend, PCI power management for link-layer, and inactive ports powered down, ultralow-power sleep mode
- Two IEEE Std 1394a-2000 fully compliant cable ports at 100M bits/s, 200M bits/s, and 400M bits/s
- Cable ports monitor line conditions for active connection to remote node
- Cable power presence monitoring
- Separate cable bias (TPBIAS) for each port
- Physical write posting of up to three outstanding transactions
- PCI burst transfers and deep FIFOs to tolerate large host latency
- External cycle timer control for customized synchronization
- Extended resume signaling for compatibility with legacy DV components
- PHY-Link logic performs system initialization and arbitration functions
- PHY-Link encode and decode functions included for data-strobe bit level encoding
- PHY-Link incoming data resynchronized to local clock
- Low-cost 24.576-MHz crystal provides transmit and receive data at 100M bits/s, 200M bits/s, and 400M bits/s
- Node power class information signaling for system power management

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i.LINK is a trademark of Sony Corporation of America.

- **Register bits give software control of contender bit, power class bits, link active control bit, and IEEE Std 1394a-2000 features**
- **Isochronous receive dual-buffer mode**
- **Out-of-order pipelining for asynchronous transmit requests**
- **Register access fail interrupt when the PHY SCLK is not active**
- **PCI power-management D0, D1, D2, and D3 power states**
- **Initial bandwidth available and initial channels available registers**
- **$\overline{\text{PME}}$ support per *1394 Open Host Controller Interface Specification***
- **Advanced submicron, low-power CMOS technology**

DESCRIPTION

The Texas Instruments PCI7621 controller is an integrated dual-socket UltraMedia PC Card controller, Smart Card controller, IEEE 1394 open HCI host controller and PHY, and flash media controller. This high-performance integrated solution provides the latest in PC Card, Smart Card, IEEE 1394, Secure Digital (SD), MultiMediaCard (MMC), Memory Stick/PRO, SmartMedia, and XD technology.

The Texas Instruments PCI7421 controller is an integrated dual-socket UltraMedia PC Card controller, IEEE 1394 Open HCI host controller and PHY, and flash media controller. This high-performance integrated solution provides the latest in PC Card, IEEE 1394, SD, MMC, Memory Stick/PRO, SmartMedia, and XD technology.

The Texas Instruments PCI7611 controller is an integrated single-socket UltraMedia PC Card controller, Smart Card controller, IEEE 1394 open HCI host controller and PHY, and flash media controller. This high-performance integrated solution provides the latest in PC Card, Smart Card, IEEE 1394, SD, MMC, Memory Stick/PRO, SmartMedia, and XD technology.

The Texas Instruments PCI7411 controller is an integrated single-socket UltraMedia PC Card controller, IEEE 1394 open HCI host controller and PHY, and flash media controller. This high-performance integrated solution provides the latest in PC Card, IEEE 1394, SD, MMC, Memory Stick/PRO, SmartMedia, and XD technology.

For the remainder of this document, the PCI7x21 controller refers to the PCI7621 and PCI7421 controllers, and the PCI7x11 controller refers to the PCI7611 and PCI7411 controllers.

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, serial and parallel interrupts, PC Card activity indicator LEDs, flash media LEDs, and other platform-specific signals. PCI complaint general-purpose events may be programmed and controlled through the multifunction terminals, and an ACPI-compliant programming interface is included for the general-purpose inputs and outputs.

The PCI7x21/PCI7x11 controller is compliant with the latest *PCI Bus Power Management Specification*, and provides several low-power modes, which enable the host power system to further reduce power consumption.

The PCI7x21/PCI7x11 controller also has a three-pin serial interface compatible with the Texas Instruments TPS2228 (default), TPS2226, TPS2224, and TPS2223A power switches. All four power switches provide power to the CardBus socket(s) on the PCI7x21/PCI7x11 controller. The power to each dedicated socket is controlled through separate power control pins. Each of these power control pins can be connected to an external 3.3-V power switch.

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)	Op Temp (°C)	Device Marking (4/5)	Samples
PCI7411GHK	OBSOLETE	BGA MICROSTAR	GHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7411ZHK	OBSOLETE	BGA MICROSTAR	ZHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7421GHK	OBSOLETE	BGA MICROSTAR	GHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7421ZHK	ACTIVE	BGA MICROSTAR	ZHK	288	90	Green (RoHS & no Sb/Br)	SNAGCU	Level-3-260C-168 HR	0 to 70	PCI7421	Samples
PCI7611GHK	OBSOLETE	BGA MICROSTAR	GHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7611ZHK	OBSOLETE	BGA MICROSTAR	ZHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7621GHK	OBSOLETE	BGA MICROSTAR	GHK	288		TBD	Call TI	Call TI	0 to 70		
PCI7621ZHK	NRND	BGA MICROSTAR	ZHK	288		TBD	Call TI	Call TI	0 to 70	PCI7621	

(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.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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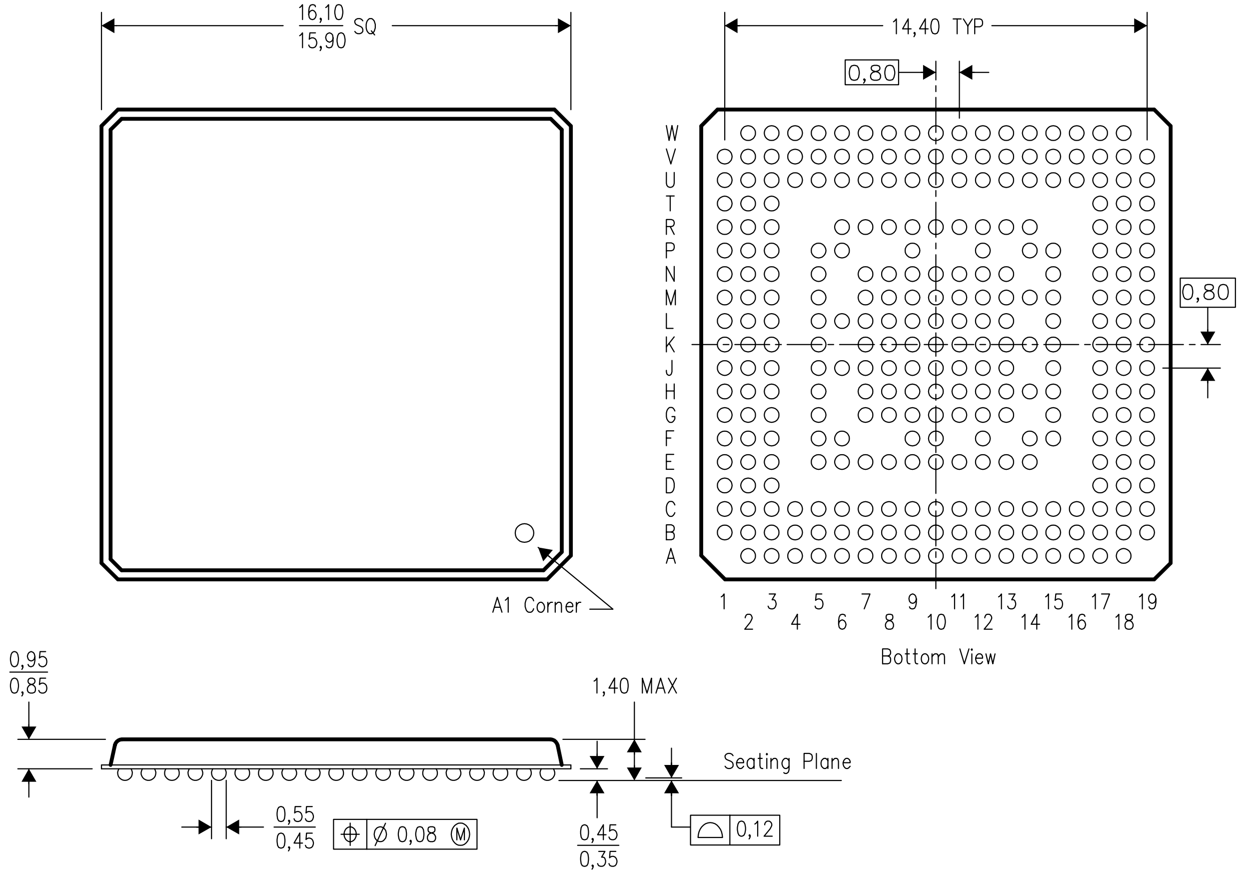
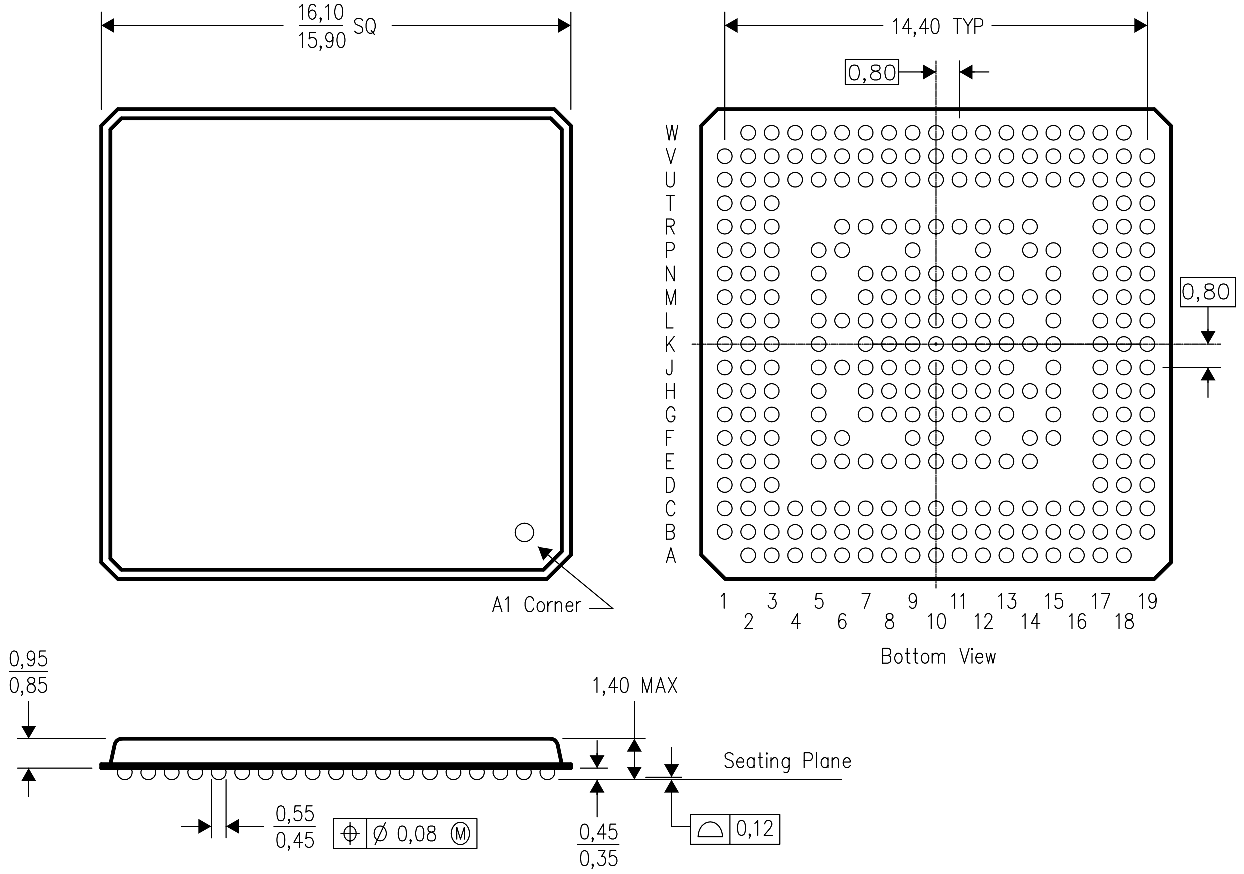
GHK (S–PBGA–N288) PLASTIC BALL GRID ARRAY



4145273–5/H 05/05

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

ZHK (S–PBGA–N288) PLASTIC BALL GRID ARRAY



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NOTES:
- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. This is a lead–free solder ball design.

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