Dual Socket CardBus and Smart Card Controller With Dedicated SD/MS-Pro Sockets

FEATURES

- ***PC Card Standard* 8.0 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**
- **Compliant with the *PCI Bus Interface Specification for PCI-to-CardBus Bridges***
- **1.8-V core logic and 3.3-V I/O cells with internal voltage regulator to generate 1.8-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**
- **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 $\overline{\text{CCLKRUN}}$ protocol and PCI bus Lock ($\overline{\text{LOCK}}$)**
- **Provides VGA/palette memory and I/O, and subtractive decoding options, LED activity terminals**
- **Power-down features to conserve energy in battery-powered applications include: automatic device power down during suspend, and ultralow-power sleep mode**
- **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**
- **PCI power-management D0, D1, D2, and D3 power states**
- **Advanced submicron, low-power CMOS technology**

DESCRIPTION

The Texas Instruments PCI6620 device is an integrated dual-socket PC Card controller, Smart Card controller, and Secure Digital (SD)/MultiMediaCard (MMC), and Memory Stick (MS)/MS-Pro controller. This high-performance integrated solution provides the latest in PC Card, Smart Card, SD, MMC, and Memory Stick technology.

The Texas Instruments PCI6420 device is an integrated dual-socket PC Card controller and SD/MMC MS/MS-Pro controller. This high-performance integrated solution provides the latest in PC Card, SD, MMC, and Memory Stick technology.

For the remainder of this document, PCI6x20 refers to both devices: PCI6620 and PCI6420.

The PCI6620 and PCI6420 are three-function PCI devices compliant with *PCI Local Bus Specification,* Revision 2.3.

Functions 0 and 1 provide the independent PC Card socket controllers compliant with the *PC Card Standard* (Release 8.0). The PCI6x20 device provides features that make it the best choice for bridging between the PCI bus, PC Cards, and Smart Cards and supports any combination of 16-bit, CardBus PC Cards, or Smart Card adapter in the socket powered at 5 V or 3.3 V, as required.

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There are no PCMCIA card and socket service software changes required to move systems from the existing CardBus socket controller to the PCI6x20 device. The PCI6x20 device is register compatible with the Intel 82365SL-DF ExCA controller and implements the host interface defined in the *PC Card Standard*. The PCI6x20 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 the pipeline architecture provide an unsurpassed performance level with sustained bursting. The PCI6x20 device can be programmed to accept posted writes to improve bus utilization. All card signals are internally buffered to allow hot insertion and removal without external buffering.

The PCI configuration header is accessed through configuration cycles specified by PCI, and it provides plug-and-play (PnP) compatibility. Furthermore, the PCI6x20 device is compliant with the *PCI Bus Power Management Interface Specification*. The PCI6x20 device supports the D0, D1, D2, and D3 power states.

The PCI6x20 design provides PCI bus master bursting, and is capable of transferring a cacheline of data at 132M bytes/s after connection to the memory controller. Because PCI latency can be large, deep FIFOs are provided to buffer the data.

The PCI6x20 device provides physical write posting buffers and a highly-tuned physical data path for SBP-2 performance. The PCI6x20 device also provides multiple isochronous contexts, multiple cacheline burst transfers, advanced internal arbitration, and bus-holding buffers.

Function 3 of the PCI6620 and PCI6420 devices is a dedicated socket that supports SD, MMC, Memory Stick, and Memory Stick-Pro cards. The Flash Media dedicated socket provides separate terminals for SD/MMC and Memory Stick signals so that both an SD/MMC card and a Memory Stick/Memory Stick-Pro card can be used concurrently.

Various implementation specific functions and general-purpose inputs and outputs are provided through eight multifunction terminals. These terminals present a system with options in PCI $\overline{\text{LOCK}}$, serial and parallel interrupts, PC Card activity indicator LEDs, and other platform specific signals. PCI-compliant 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 PCI6x20 device 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 PCI6x20 device also has a three-pin serial interface compatible with both the Texas Instruments TPS2226 and TPS2228 power switches. The TPS2226 or TPS2228 power switch provides power to the two CardBus sockets on the PCI6x20 device. The power to each dedicated socket is controlled through separate power control terminals. 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]
PCI6620GHK	OBSOLETE	BGA MICROSTAR	GHK	288		TBD	Call TI	Call TI
PCI6620ZHK	OBSOLETE	BGA MICROSTAR	ZHK	288		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.
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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.

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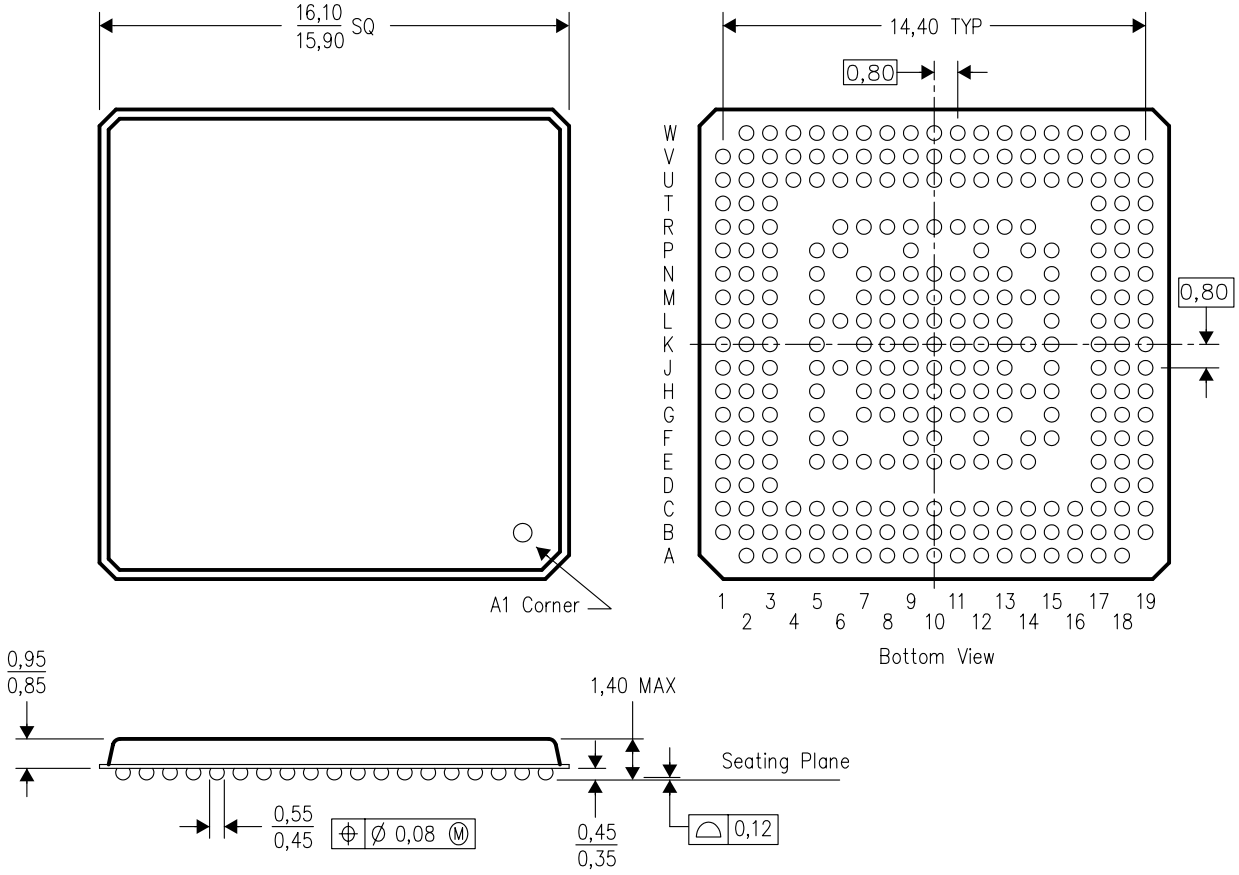
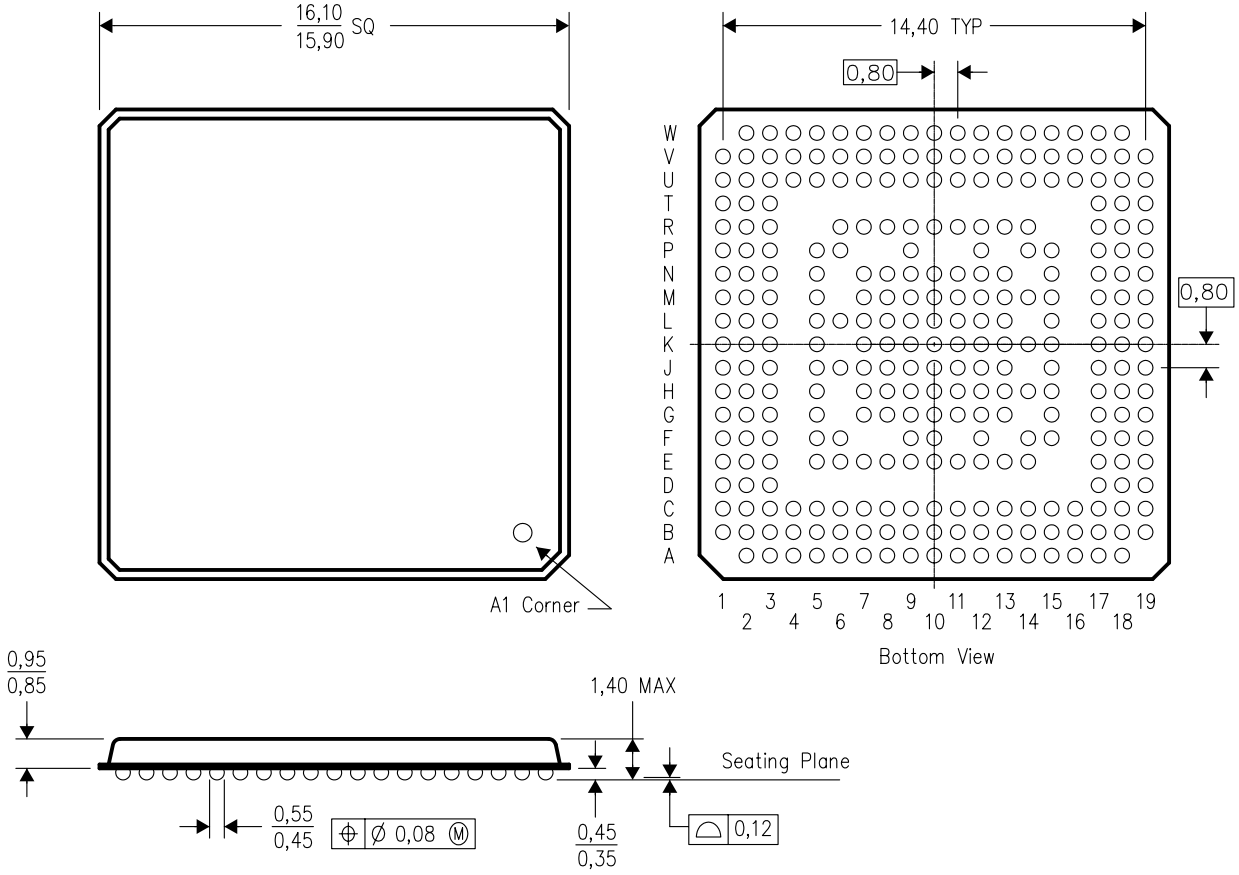
GHK (S–PBGA–N288) PLASTIC BALL GRID ARRAY



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



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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