PC Card Controllers

FEATURES

- **Ability to wake from $D3_{hot}$ and $D3_{cold}$**
- **Fully compatible with the Intel 430TX (Mobile Triton II) chipset**
- **A 144-terminal low-profile QFP (PGE), 144-terminal MicroStar BGA™ ball grid array (GGU) package, or 209-terminal MicroStar BGA™ (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-Mbps sustained throughput from CardBus to PCI and from PCI to CardBus**
- **Interface to parallel single-slot PC Card power interface switches like the TI TPS2211**
- **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**
- **Intel 82365SL-DF and 82365SL register compatible**
- **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 $\overline{\text{CCLKRUN}}$**
- **Socket activity LED pins**
- **PCI bus lock ($\overline{\text{LOCK}}$)**
- **Advanced submicron, low-power CMOS technology**
- **Internal ring oscillator**

DESCRIPTION

The TI™ PCI1410 is a high-performance PCI-to-PC Card controller that supports a single PC Card socket compliant with the *1997 PC Card Standard*. The PCI1410 provides features that make it the best choice for bridging between PCI and PC Cards in both notebook and desktop computers. The *1997 PC Card Standard* retains the 16-bit PC Card specification defined in *PCI Local Bus Specification* and defines the new 32-bit PC Card, CardBus, capable of full 32-bit data transfers at 33 MHz. The PCI1410 supports both 16-bit and CardBus PC Cards, powered at 5 V or 3.3 V, as required.

The PCI1410 is compliant with the *PCI Local Bus Specification*, and its PCI interface can act as either a PCI master device or a PCI slave device. The PCI bus mastering is initiated during 16-bit PC Card DMA transfers or CardBus PC Card bridging transactions. The PCI1410 is also compliant with the latest *PCI Bus Power Management Interface Specification* and *PCI Bus Power Management Interface Specification for PCI to CardBus Bridges*.

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All card signals are internally buffered to allow hot insertion and removal without external buffering. The PCI1410 is register compatible with the Intel™ 82365SL-DF and 82365SL ExCA controllers. The PCI1410 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 PCI1410 can also be programmed to accept fast posted writes to improve system-bus utilization.

Multiple system-interrupt signaling options are provided, including: parallel PCI, parallel ISA, serialized ISA, and serialized PCI. Furthermore, general-purpose inputs and outputs are provided for the board designer to implement sideband functions. Many other features designed into the PCI1410, such as socket activity light-emitting diode (LED) outputs, are discussed in detail throughout the design specification.

An advanced complementary metal-oxide semiconductor (CMOS) process achieves low system power consumption while operating at PCI clock rates up to 33 MHz. Several low-power modes enable the host power management system to further reduce power consumption.

NOTE:

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

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
PCI1410GGU	OBSOLETE	BGA MICROSTAR	GGU	144		TBD	Call TI	Call TI
PCI1410PGE	OBSOLETE	LQFP	PGE	144		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.

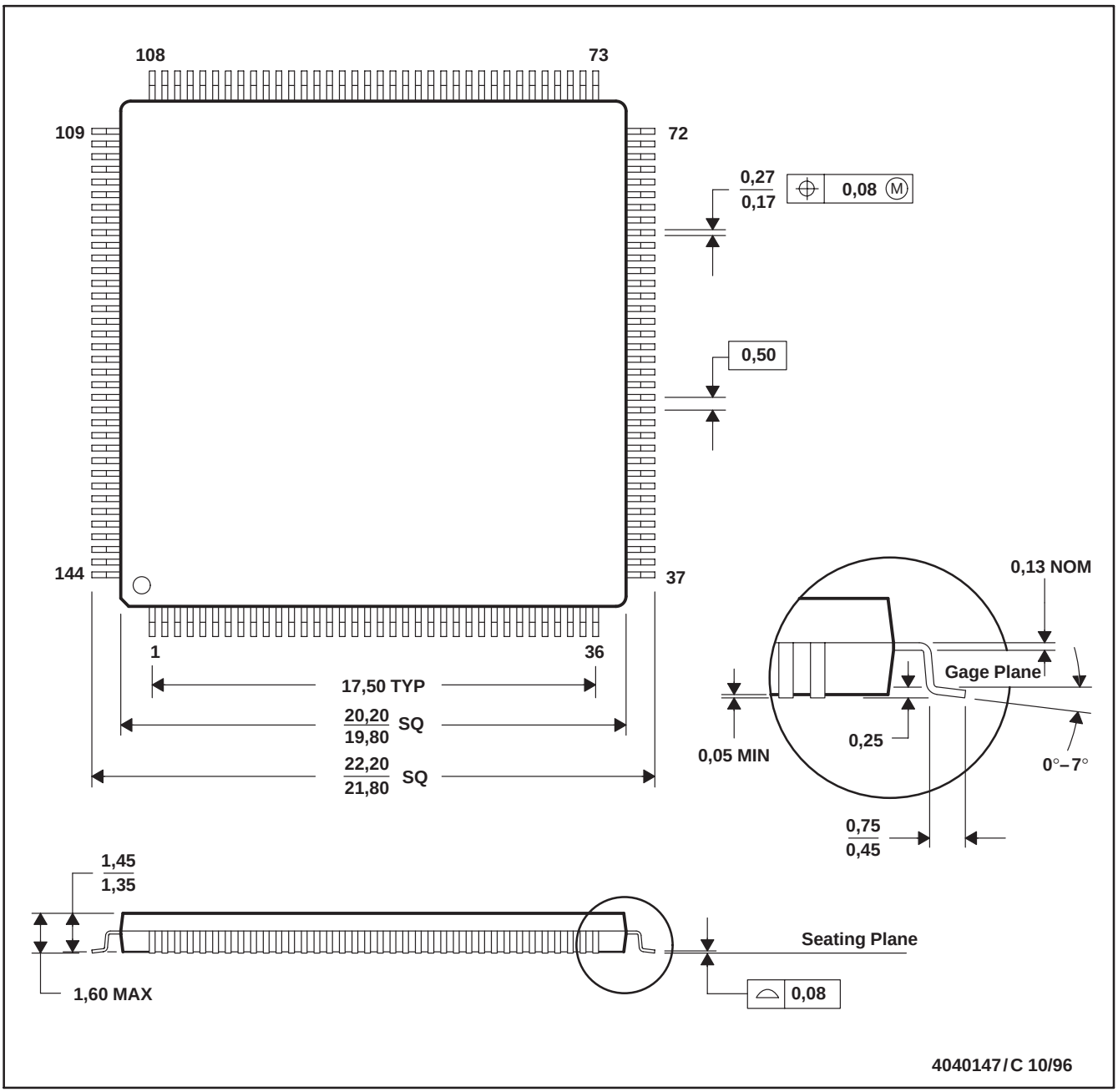
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MTQF017A – OCTOBER 1994 – REVISED DECEMBER 1996

PGE (S-PQFP-G144) **PLASTIC QUAD FLATPACK**

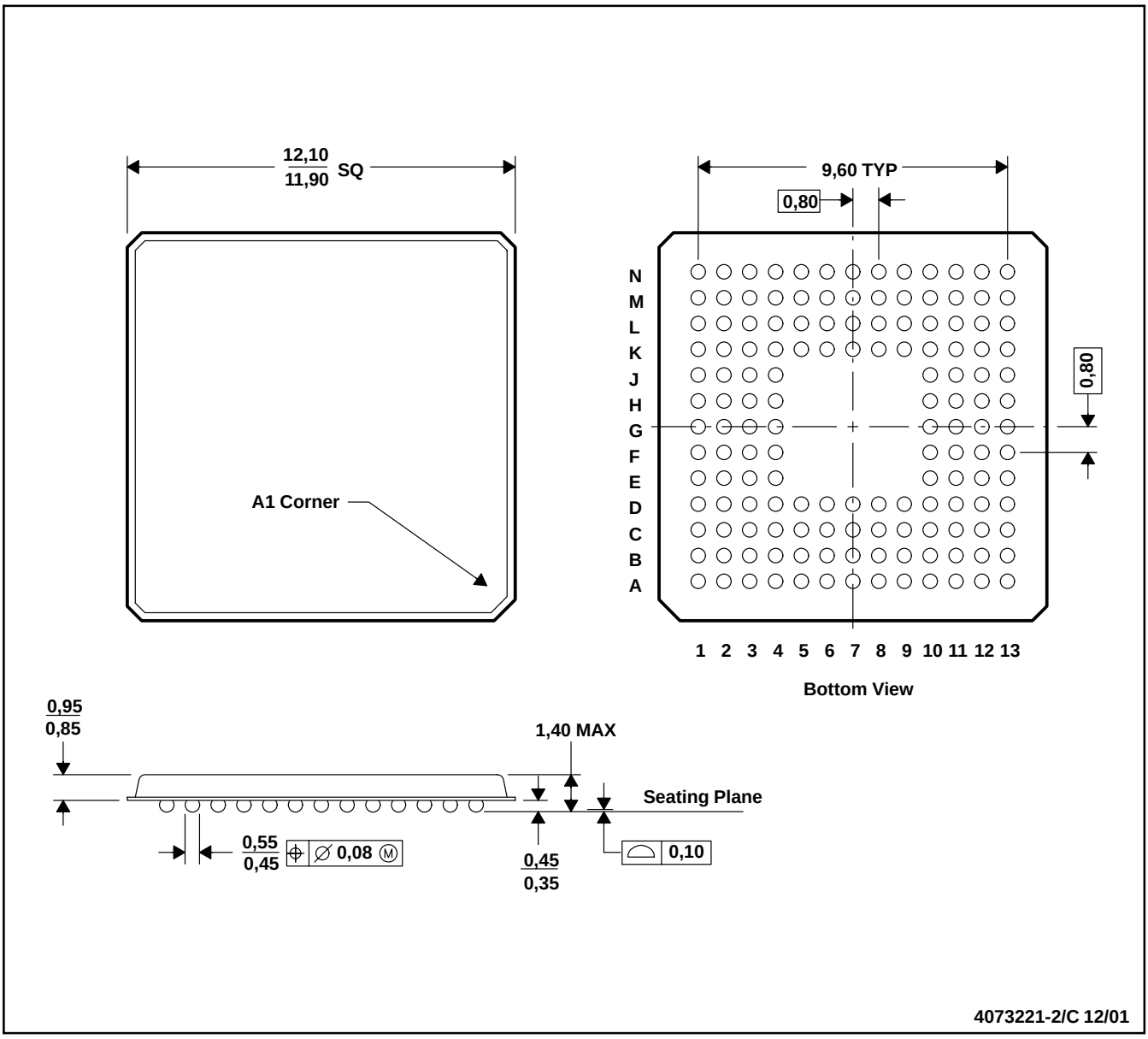


NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS-026

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MPBG021C – DECEMBER 1996 – REVISED MAY 2002

GGU (S–PBGA–N144) **PLASTIC BALL GRID ARRAY**



NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice
C. MicroStar BGA™ configuration

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