1 Features

The AMD-640™ chipset is a highly integrated system solution designed to deliver superior performance for the AMD-K5™ processor, AMD-K6™ MMX processor, and other Socket 7-compatible processors. The AMD-640 chipset consists of the AMD-640 System Controller in a 328-pin BGA package and the AMD-645™ Peripheral Bus Controller in a 208-pin PQFP package. The AMD-645 Peripheral Bus Controller features an integrated ISA bus controller, enhanced master mode PCI IDE controller with ultra DMA-33 support, USB controller, keyboard/mouse controller, and real-time clock.

This document describes the features and operation of the AMD-645 Peripheral Bus Controller. For a description of the AMD-640 System Controller, see the *AMD-640 System Controller Data Sheet*, order# 21090. Key features of the AMD-645 Peripheral Bus Controller are provided in this section.

1.1 Enhanced IDE Controller

- Enhanced master mode PCI IDE controller with Ultra DMA-33 support
- Dual channel master mode PCI supporting four enhanced IDE devices
- Transfer rate up to 33 Mbytes per second to cover PIO mode 4 and multi-word DMA mode 2 drivers, and Ultra DMA-33/ ATA-33 interface
- Sixteen levels (doublewords) of prefetch and write buffers
- Interlaced commands between the two channels
- Bus master programming interface for SFF-8038i, rev. 1.0 and Microsoft Windows 95® compliance
- Full scatter-gather capability
- Supports ATAPI-compliant devices
- Supports PCI native and ATA compatibility modes
- Complete software driver support

1.2 Universal Serial Bus Controller

- USB v. 1.0 and Intel Universal HCI v. 1.1-compatible
- Eighteen-level (doubleword) data FIFOs
- Root hub and two function ports with built-in physical layer transceivers
- Legacy keyboard and PS/2 mouse support

1.3 Plug-N-Play Support

- PCI interrupts steerable to any interrupt channel
- Three steerable interrupt channels and DMA signal steering with Plug-N-Play control
- Microsoft Windows 95 and Plug-N-Play BIOS compliant

1.4 Sophisticated Power Management

- Supports both ACPI (Advanced Configuration and Power Interface) and legacy (APM) power management
- ACPI v.0.9 Compliant
- APM v.1.2 Compliant
- Supports soft-off and power-on suspend with hardware automatic wakeup
- One idle timer, one peripheral timer, and one general purpose timer, plus 24- and 32-bit APCI-compliant timer
- Dedicated input pin for external modem ring indicator for system wakeup
- Normal, doze, sleep, suspend, and conserve modes
- System event monitoring with two event classes
- Five multipurpose I/O pins plus support for up to 16 general purpose input ports and 16 output ports
- Primary and secondary interrupt differentiation for individual channels
- Clock throttling control
- Multiple internal and external $\overline{\text{SMI}}$ sources for flexible power management

1.5 PC97-Compliant PCI-to-ISA Bridge

- Dual cascaded AT-compatible 8259 interrupt controllers
- AT-compatible 8255 programmable interval timer
- Dual AT-compatible 8237 DMA controllers
- Distributed DMA support for ISA legacy DMA across the PCI bus
- Integrated keyboard controller with PS/2 mouse support
- Integrated real-time clock with extended 256-byte CMOS RAM
- PCI v. 2.1-compliant interface
- Eight double-word line buffer between PCI and ISA bus
- One level of PCI to ISA post-write buffer
- Supports type F DMA transfers
- Fast reset and gate A20 operation
- Edge-triggered or level-sensitive interrupts
- Flash, 2-Mbyte EPROM, and combined BIOS support
- Programmable ISA bus clock
- Supports external IOAPIC interface with symmetrical multiprocessor configurations

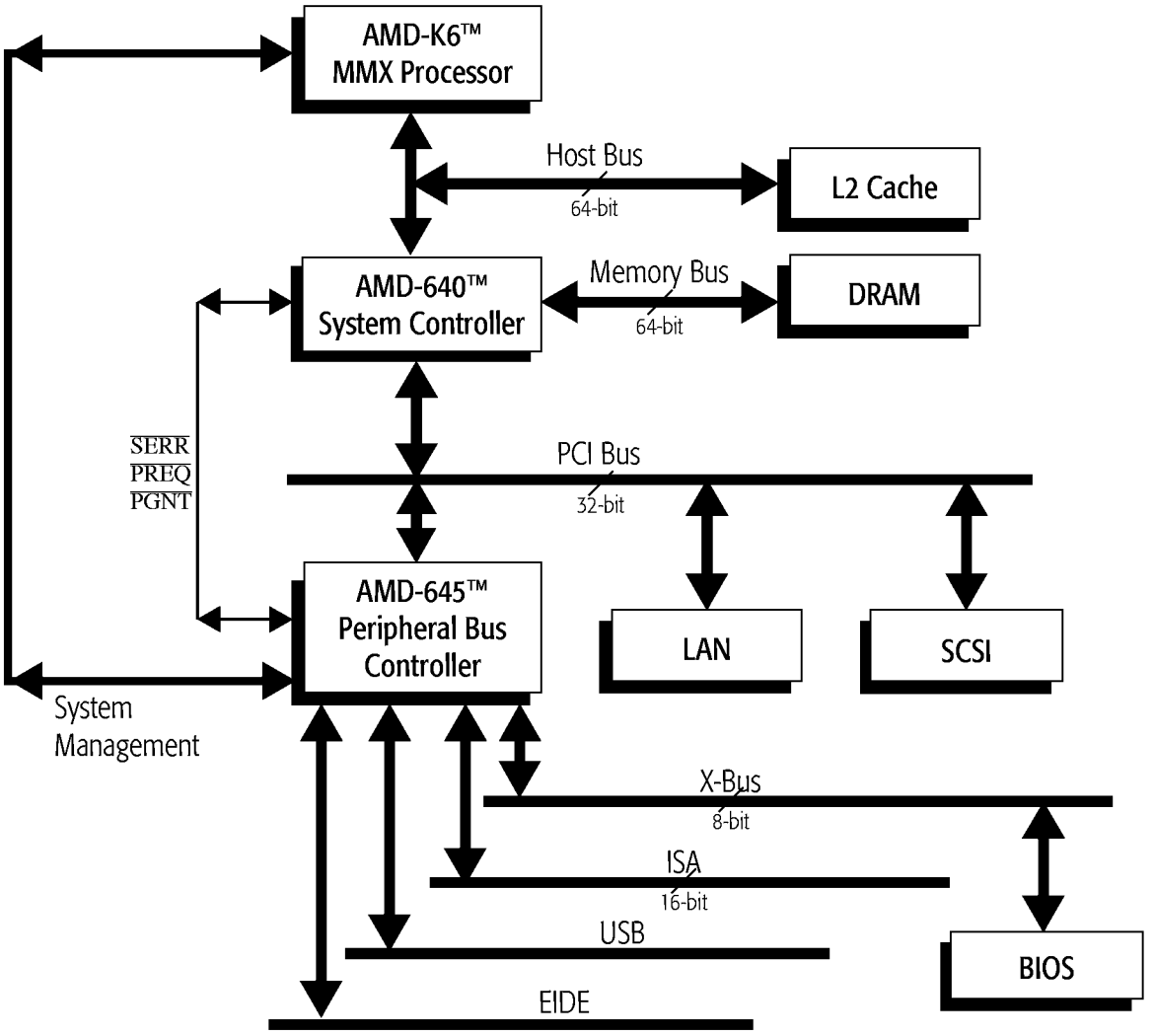

Figure 1-1. AMD-640 Chipset System Block Diagram

12 Package Specifications

The AMD-645 Peripheral Bus Controller is available as a 208-pin plastic quad flat pack (PQFP). The thermal specifications are as follows:

θ_{JA} = 37 °C/W

θ_{JC} = 4.7 °C/W

Figure 12-1 is a drawing of the 208-pin PQFP.

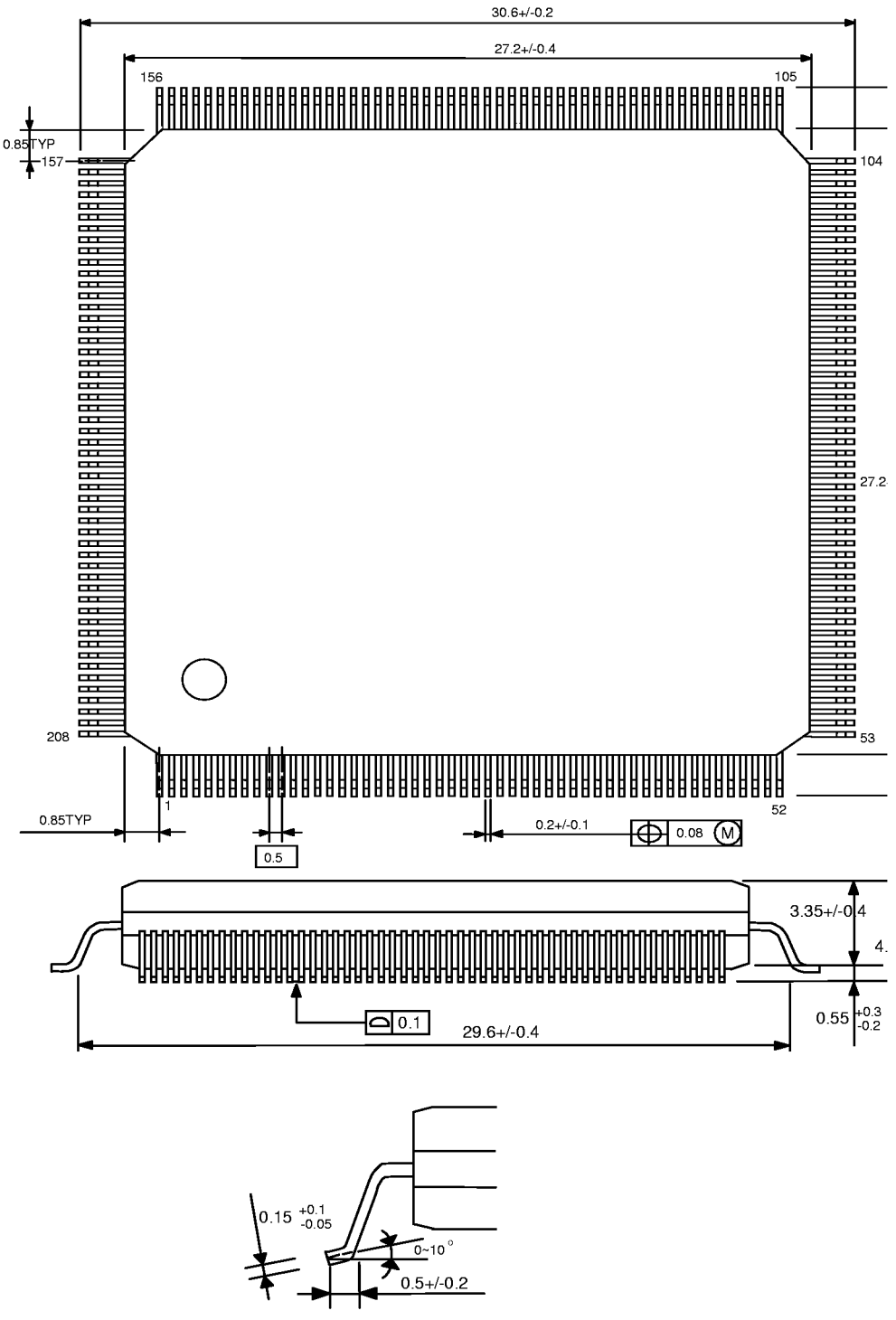

Figure 12-1. 208-Pin Plastic Quad Flat Pack Outline Drawing